SEP 15 1960
SCIENCES

Cover story:

Setting beam forms

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10 New methods worked out to lay reinforced blacktop

48 Underground slabs help anchor piers for casting beds

70 Prestressed piles stand unusually hard driving

ONTRACTORS and ENGINEERS

A Buttenheim Publication

AZINE OF MODERN C NSTRUCTION SEPTEMBER 1960

Hot-mix Texaco Asphaltic Concrete pavement is speedily laid on 11 miles of Nebraska State Highway 61. No time-consuming curing period is required.

Nebraska builds Asphalt highway for hauling wheat crop

This 11-mile section of State Highway 61 passes through Nebraska's fertile wheat-growing country. At harvest time, heavy trucks loaded with grain use the highway to reach elevators and rail heads.

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CONTRACTORS and ENGINEERS

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Open-cut tunnel construction. Page 22

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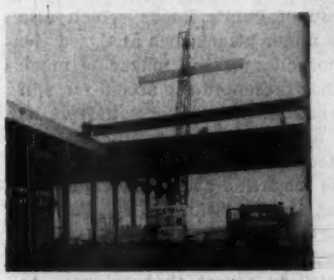

Prestressed tees for roof. Page 88

COVER:

Consumers Co., Chicago, explores new methods of handling the prestressing of beams—of unusual design and various lengths—for the Parke-Davis chemical plant at Holland, Mich. While workmen guide the Watco double form section, a 25-ton-capacity Travelift lowers it onto the tensioned bed for a 65-foot drop-in roof beam. Page 40.

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Editorial

Codes and complications

As the Prestressed Concrete Institute meets in New York City this month for its sixth annual convention, the no longer fledgling organization of prestressed producers and affiliates is faced with a problem that has arisen with the growth of this particular industry. The theme of the meeting is: "Prestressed Concrete—Key to Creative Architecture and Imaginative Engineering." As the industry strives to develop the realities of this theme, it runs head on into building codes throughout the country that do not necessarily encourage creativity or imagination in designing and constructing with prestressed concrete. This attitude is even found in the three largest cities of the nation—New York, Chicago, and Los Angeles.

Many city building codes are of the type known as specification codes, and unless a specific material or method is included in the code, the builder has a tough time convincing the proper authorities that the new material or procedure should be permitted. The performance type of code is more liberal, in that new materials that meet definite basic requirements are permitted, after impartial testing.

Thus New York City is lacking in code provisions for the adequate testing of prestressed concrete under fires and loads. Chicago, which resisted the admission of truck-mix concrete for many years, wants to be shown to everyone's satisfaction that prestressed concrete is as safe in fires as is reinforced concrete. In Los Angeles, building construction with prestressed concrete is permitted, but certain restrictions have slowed progress.

Such a situation calls for a reappraisal of existing building codes by architects, engineers, contractors, and suppliers of materials. Codes must be adequate to insure safety in construction. But they should also be flexible enough so that new methods and materials, developed out of construction technology, should not be denied a chance to demonstrate their worth. Uniformity in codes is also desirable, so that the designers, producers, and builders can work freely, and economically, without being hampered by conflicting restrictions of various localities. Modernizing building codes is not easy, but it must be done if creative architecture and imaginative engineering are to have their way.

More about "Sticks and stones–and highways"

Our August editorial, under the above-quoted title, was an answer to a criticism of the 41,000-mile interstate highway program that appeared in the July issue of *Reader's Digest*. The U. S. Bureau of Public Roads, which also came under attack, has analyzed the various charges the magazine made and has presented the actual facts in each case in order to correct errors, as well as to provide pertinent facts omitted in the article.

The magazine article concluded by urging anyone "who has specific evidence of tax dollars going down the highway program's multibillion dollar rathole" to report that evidence to Congressman John A. Blatnik, chairman of a House investigating subcommittee. The BPR analysis winds up: "By all means let him report any such evidence to Representative Blatnik. Let him also report it to the appropriate State highway department. Let him also report it to the Bureau of Public Roads, Department of Commerce and to the Federal Bureau of Investigation, Department of Justice."

Among others who also have replied to the *Reader's Digest* article is John O. Morton, Commissioner, New Hampshire Department of Public Works and Highways. Commissioner Morton is a veteran construction man and engineer who has worked for 30 years both on the contracting and state-agency sides of the industry. Calling for a clear, unbiased view of the picture from all sides, Morton wrote the magazine: "It is easy to magnify and easy, by innuendo, to multiply those relatively few occasions (error in judgment, corruption, and misdoings) instead of showing the whole picture where the high majority of great accomplishments would be obvious.

"You could have turned the picture again and written about increased traffic safety on these new Interstate highways, how modern design standards, including controlled access, can sharply reduce highway accidents, how the death rate on most of the country's toll expressways last year per one hundred million vehicle miles of travel was about one-third the national rate on rural roads. Safety, the human life factor, is perhaps the greatest of all benefits of these new highways.

"It continues to seem to me that it is a credit to the Bureau of Public Roads and the State Highway Departments that this program has had so little 'bungle.' It could be disastrous if this joint undertaking involving thousands and thousands of conscientious, honest, dedicated engineers, administrators, and contractors, as well as the economy of our country and safety of our traveling public were to suffer irreparably, merely because the misleading, specious, gossipy, selfish interest sides were shown instead of the full dimension, truthful picture."

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Business Comment

The Second Half

Construction volume in 1960 is hovering at about the level of a year ago. First-half trends indicate that total expenditures for all categories of new construction will reach $55.8 billion before the end of the year.

Allowing for a moderate rise in costs, the physical volume of 1960 work will probably be slightly below the 1959 level.

Even so, most categories of construction will show an increase this year over 1959. There will be big gains in the volume of industrial, social, and recreational building, and nonresidential building is expected to reach a record $10 billion.

Highway construction volume will come to within 1 per cent of the 1959 level by the year's end.

The over-all economic level of the construction industry is remaining constant because of a decline of about $2 billion in private and public residential building.

A sharp upturn in business plant and equipment expenditures during the first half of 1960 has tended, till now, to soak up the increasing supply of investment funds, limiting housing starts.

Industrial construction has recovered strongly from the depressed 1959 level of $2.1 billion. Still, the current level of $2.7 billion is almost $1 billion below the peak industrial investment year of 1957.

Commercial construction in 1960 should exceed $4 billion—well above the previous peak of 1959.

The boom in office building—still going strong—will bring the combined office-building and warehouse sector of construction to a level 7 per cent above 1959. This would reverse a small decline registered in 1959.

The outlook for public-utility construction for the remainder of 1960 is mixed. Railroad, telephone, and gas utilities jobs will be up substantially for the year. But electric-power and oil-pipeline construction are both trending down. Taken as a whole, public-utility construction will probably show a small gain for the year.

Federal spending policy is chiefly responsible for the nominal decline in public construction from a $16.2 billion level in 1959 to $16 billion in 1960.

Public residential work has been hit by a 50 per cent drop in Capehart military-housing starts, and a drop in the level of New York City's public-housing program. Spending this year will decline about one-seventh from the 1959 level of about $1 billion.

Highway construction is trending up sharply and will continue to do so through the remaining months of 1960. The outlook for the full year, as noted, is for highway spending to recover to a level just slightly below that of 1959.

The trend in other types of public construction is mixed. Educational construction will just about reach the 1959 level, while public-service, conservation and development, and public industrial work will be up sharply. Sewer construction is proceeding at about the 1959 level.

TREND IN NEW CONSTRUCTION SPENDING: MID-YEAR ESTIMATE

Type of construction	Value (in millions) 1959	Value (in millions) 1960 Estimated	Percent change 1958-59	Percent change 1959-60
TOTAL NEW CONSTRUCTION	$56,033	$55,825	+10	*
PRIVATE CONSTRUCTION	39,848	39,825	+14	*
Residential buildings (nonfarm)	24,469	22,925	+24	− 6
Nonresidential buildings (nonfarm)	8,889	10,075	+ 2	+14
Industrial	2,106	2,700	−12	+28
Commercial	3,930	4,300	+ 9	+ 7
Other nonresidential buildings	2,823	3,175	+ 4	+12
Farm construction	1,261	1,150	+12	− 9
Public utilities	5,052	5,375	− 1	+ 6
All other private	207	300	+ 9	+45
PUBLIC CONSTRUCTION	16,185	16,000	+ 4	− 1
Residential buildings	962	825	+13	−14
Nonresidential buildings	4,502	4,550	− 4	+ 1
Military facilities	1,459	1,225	+ 1	−16
Highways	5,888	5,800	+ 5	− 1
Sewer and water systems	1,467	1,525	+ 5	+ 4
Public service enterprises	551	650	+22	+18
Conservation and development	1,127	1,200	+10	+ 6
All other public	229	225	+48	− 2

Source: Bureau of the Census and Business and Defense Services Adm.
*Change of less than half of 1 percent.

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Surveying Washington

by E. E. Halmos, Jr.

Facts on foreign market for contractors, suppliers

You can get a good idea of the size of the foreign market for construction contractors and suppliers from the first annual report of the 2-year-old Development Loan Fund. (The first year was spent largely in staffing, hence no previous report was made.)

In its first two years, DLF committed $948 million in approved loans and guaranties; it received 585 separate loan applications, seeking a total of $3.9 billion, from 59 countries.

The greatest proportion of the money goes for transportation and communications work—railroads, highways, telephone and telegraph systems, and the like. This category accounted for $299.3 million. Power and multipurpose water projects accounted for $180 million; water supply and community development, $87.3 million; and irrigation and drainage, $54.9 million.

And DLF is only part of the huge reservoir of money in Washington that's being fed out for development abroad involving construction. For instance, Congress only recently approved—and the U. S. Treasury paid in—a contribution of $79.6 million as the first installment of the U. S. subscription to the newly formed Inter-American Development Bank. Eventual capitalization of this bank will be $1 billion.

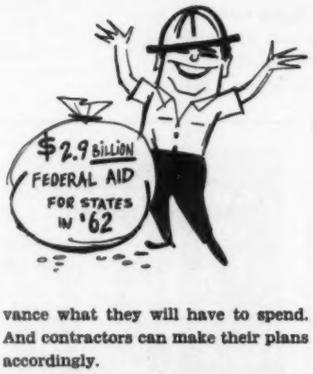
Go-ahead for big projects — providing money is found

That $1.4 billion authorization (not "appropriation," please note) for future flood-control, navigation, and water-conservation projects of the Corps of Engineers contains some interesting aspects for construction. The bill authorizes the Corps to start work—when it gets money—on 120 projects, among them 19 new navigation works and 11 flood-control surveys.

Of special interest is the Congressional okay for work on 17 Great Lakes harbors, at an eventual cost of about $87 million. Over all, the bill covers 56 new navigation projects, including the Great Lakes work, that'll cost $203.5 million; and 44 flood-control works, to cost $277.6 million.

Marking of '62 road funds aid to long-range planning

The recent action of the Bureau of Public Roads in apportioning $2.9 billion of federal aid to the states for the 1962 fiscal year should have a strong effect on the construction economy. For the first time in several years, the states will know well in advance what they will have to spend. And contractors can make their plans accordingly.



The allocation includes the full authorized amount of $2.2 billion for interstate highways and three-quarters of the $925 million authorized recently for ABC (primary, secondary, and urban) systems. Since ABC allocations are made on a formula that includes population, part of the money is being withheld until more current census figures are available.

Reasons for the apportionment [illegible] this time are many—and they obviously include politics. But most important is the fact that the Highway Trust Fund is once again considered to be in good enough shape to support the full program, after stricture caused by overenthusiastic appropriations by Congress in 1958. Thus—barring a further inroad on the fund for some "emergency" purpose—contractors are assured that the highway programs will proceed as scheduled for at least two years.

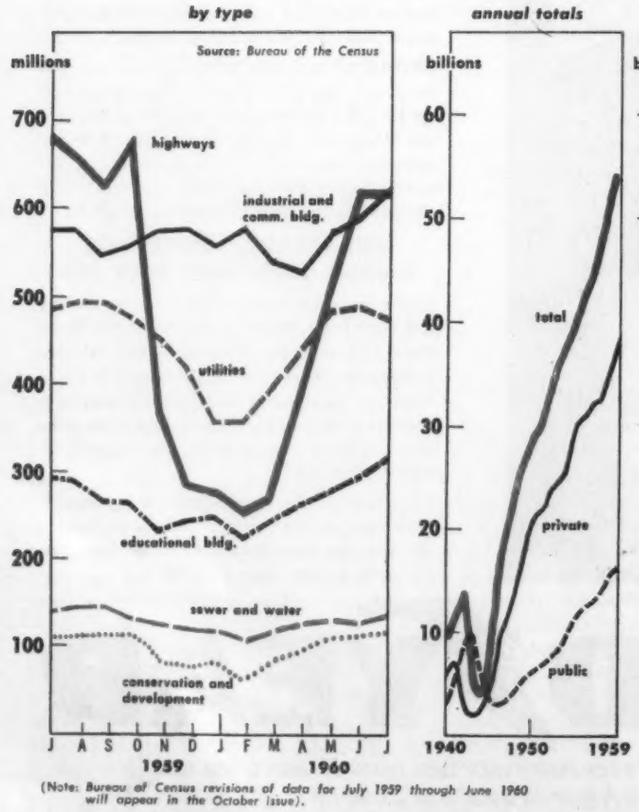
And, following so closely on the announcement of restricted apportionments for fiscal year 1961 ($1.8 billion for interstate roads, for instance), the 1962 allocation should give both contractors and suppliers a needed boost in morale, not to mention their pocketbook.

One immediate effect may be to offset the predicted 1960 drop in construction-machinery shipments which has already caused cutbacks in production schedules at many plants. You may have seen the figures that are worrying manufacturers: The Business and Defense Services Administration has estimated that construction-machinery shipments in 1960 will drop to about $1.7 billion, on the basis of the first six months' business. That compares with shipments of $1.8 billion in 1959 and represents a production rate of only about 60 per cent of plant capacity. Most of

Industry Trends

DOLLAR VALUE OF NEW CONSTRUCTION

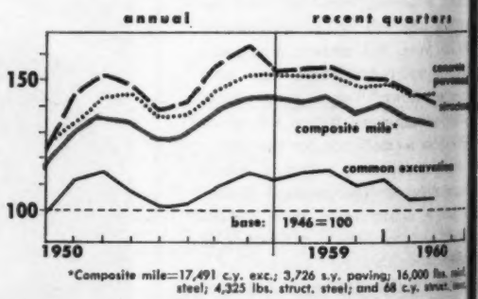
Recent Monthly Trends



(Note: Bureau of Census revisions of data for July 1959 through June 1960 will appear in the October issue).

AVERAGE BID PRICES

Federal Aid Highway Construction



*Composite mile=17,491 c.y. exc.; 3,726 s.y. paving; 16,000 lbs. reinf. steel; 4,325 lbs. struct. steel; and 68 c.y. struct. conc.

Source: Bureau of Public Roads

PRICE INDEX 1947-1949 = 100

Source: Bureau of Labor Statistics' Wholesale Prices and Indexes

blame for the machinery slump has been assigned to the slowdown in highway contract letting over the past year, plus some dumping of government-owned surplus.

The direct effect on contractors is hard to judge at this point. It can be argued that the prospect of assured business extending well into the future might ease the pressure on bid prices, which has forced a slow decline in the cost of highway construction as measured by BPR's price index—down 3.2 per cent since the year started.

But it can also be argued that the long-term business prospect might tempt even more contractors into the field. (There are already 11,300 contractors eligible to bid on federal-aid highway contracts.) Such an influx would tend to hold prices down and make competition among contractors go to even higher levels.

The best guess in Washington is that there'll be little effect on prices. And at this moment, an educated guess is the most anyone can make.

On highways, keep in mind that Congress will take a complete new look at the program in January, when it begins to get new reports from BPR. Whatever Congress does won't affect the allocations just announced, but it could well change other aspects of the program. Well aware of this, several construction organizations are already at work formulating their own stands, come the next session of the legislature. The American Road Builders' Association, for instance, has already named a committee to study ARBA's position with regard to financing of federal-aid highways.

New construction "bosses" for missile-base work

For contractors, here's the significance of the Corps of Engineers' shakeup in its missile-base construction procedures:

1. It presents contractors with a whole new set of "bosses."

2. It promises quicker action and quicker decisions in the many changes that are necessary in the work.

3. It represents a radical departure from the Corps' traditional chain of command.

4. It will establish a central point from which all contract letting, as well as supervision, will be handled.

For a quick review, this is what happened:

In answer to mounting criticism—much of it from the Air Force—about delays on missile-base construction, the Corps has now established the Corps of Engineers Ballistic Missile Construction Office (CEBMCO) at Inglewood, Calif. The commander is Brig. Gen. Alvin C. Welling, who has just completed a 3-year tour as engineer-commissioner of Washington, D. C. He has a direct wire to the office of the Chief of Engineers, and has complete authority to cut across traditional Engineer district and division lines.

All area and site engineers will report directly to CEBMCO; all contracts will be let by this office, which will have full authority to make changes and authorize other actions to speed construction work at missile bases.

Brig. Gen. Welling immediately announced that he will work through five "vice presidents"—senior officers—who will have direct responsibility for specific missile programs, such as bases for Atlas, Titan, etc. The CEBMCO staff, consisting initially of 125 officers and civilians, but eventually to number perhaps 1,000 or more, will be organized around these five senior officers.

The various shifts in this area of missile-base construction are surface evidence of deep and sometimes bitter controversy within the services over such construction; the Air Force, under heavy criticism as the political campaigns get under way, is inclined to blame construction men and construction practices for the delays that have been reported at certain installations.

The Corps of Engineers—as well as many engineers and contractors—places blame for delays on two points: (1) the doctrine of "concurrency," which means that bases are being built before missiles have been completed and tested, a practice necessitating changes in design and construction; and (2) the fact that it does not have complete control of design phases, coming into the picture only after the Ballistic Missiles Division has set design patterns for installations to be built.

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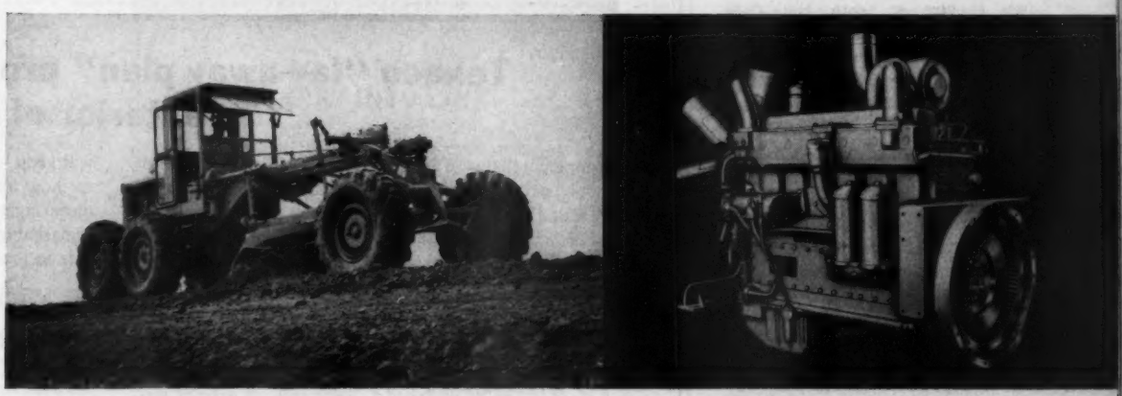

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Tricks of the Trade

Locking wrenches hold joint formers in jig

Locking plier wrenches, commonly called vise-grips, filled a unique but useful role in conjunction with a contractor-built jointing machine for forming transverse joints on a concrete heliport apron.

Five of these wrenches, welded to a jig, held the light metal dummy joint formers in place while they were being forced down into the fresh concrete. A touch of the release handles loosened the grip of the wrenches instantly when the joint had been placed.

The device was designed and built by the Gordon H. Ball Co., Danville, Calif., and was first used on the paving of two huge aprons at the Marine Air Facility at Santa Ana, Calif. These aprons are made up of a series of 25-foot-wide lanes of 6-inch-thick concrete paving. Each lane has a longitudinal center joint and transverse joints at 15-foot intervals.

When the job started, a subcontractor did the work of sawing the joints with a diamond-edged saw. When this proved too costly, Ball designed a jointing machine using light metal dummy joint formers that were inserted right behind the finisher and were removed the following day. The Madsen Works built the machine to Ball's specifications on the frame of an abandoned concrete spreader.

A vibrating T-bar on the front of the machine cuts the joint in the fresh concrete. At the same time, two workmen on a platform at the rear of the machine are placing the metal dummy joint formers in the joint that was previously cut. Since the machine is 15 feet long, the rear platform is in proper position for placing the joint formers while the T-bar is cutting the next joint.

To simplify the placing of the joint formers, the contractor designed and built a jig that holds the preformed light metal strips. This is a light pipe frame with an angle iron along the bottom. Welded to the angle iron are the five vise-grip wrenches.

On a job, the workmen generally use only the two at each end. The men place one of the 12.5-foot-long joint formers in the jig and snap the wrenches shut to grip it securely. They insert the joint former into the concrete at the proper place, where the coarse aggregate has been pushed aside by the vibrating T-bar. When the metal strip is in place and down to grade, they actuate the release levers of the two wrenches, and the jig is immediately free.

Then they walk across to the other side of the slab and repeat the operation. This jig works so well and so quickly that the men have plenty of time to place the two dummy joint formers in the 1½ to 2½ minutes that the machine is standing still while the next joint is being cut.

This speed is required to keep pace with the fast-moving paving spread on this thin slab. With two 34-E Twinbatch pavers feeding concrete onto a 6-inch slab, the entire spread has to move along at about 6 fpm or faster. This means that one of the transverse joints must be completed every 2 to 2½ minutes.

LUBE LOGIC

Five tips t

Texaco "lay-away plan" protects exterior of idle equipment

Equipment that won't be needed for a while is sometimes simply parked somewhere so nobody will fall over it. Well and good, but not enough—because rust and corrosion account for almost half of what you spend on equipment maintenance. Here's a 6-step program that will keep idle equipment in cracker jack shape no m ter how long it's out of use, or where it's stored. T basic ingredient is Texaco Rustproof Compound L remarkable product that keeps rust from starting, acts to loosen rust that's already on the equipment.

1. Before applying Texaco Rustproof Compound L, make sure all exterior surfaces are clean and fairly dry.

2. Coat all adjustment bolts and other exposed threads with Rustproof Compound to facilitate removal or adjustment.

3. At temperatures of 65° or more, Texaco Rustproof Compound L can be applied to smooth accessible surfaces by brushing.

4. At temperatures below 65°F, or for inaccessible and complicated areas, spraying is the best way. You can thin the Rustproof Compound to a sprayable consistency by adding naphtha to form a 10 to 50% solution. Add the naphtha slowly to the compound and stir vigorously so the whole batch is the same consistency.

5. Apply tags at conspicuous point the equipment describing the rustpro measures that have been taken.

6. Thoroughly lubricate all equip before storage.

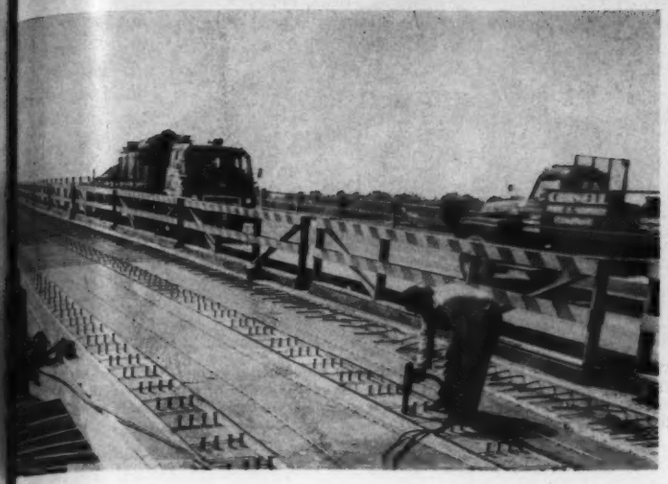
Starting up equipment after stora

1. In most cases it's not necessary remove Texaco Rustproof Compou You should, however, remove it from faces that will come into contact with sonnel (such as ladders, seats and hand and from surfaces that are heated high temperatures when the equip is operated.

2. Since Texaco Rustproof Compou is *not* a lubricant, all working surfaces lubrication fittings should be wiped cl before use, and the correct lubric should be applied before starting up.

Thicker oil won't stop gear-case drooling

You can't fix leaking seals on a gear-case simply by switching to a heavier-grade gear lubricant, because in gear cases carrying heavy loads, the thicker oil simply increases gear-case temperature, which thins out the oil and it starts leaking again. Sometimes, however, foaming and leaking of gear-case lubric indicates that the oil level is too high. By keepi vents open and keeping the oil at the recommend level, you prevent build-up of pressure which wo cause leakage.



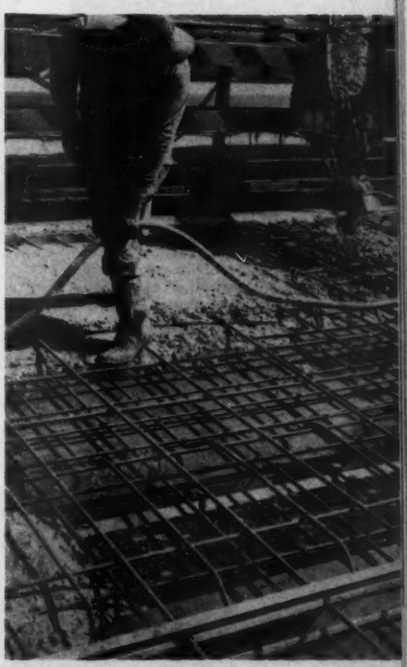
End-welded studs cut installation time on composite bridge deck

Swift installation of shear connector studs cut down considerably on work time during composite construction for the deck of a reconstructed viaduct. And the small additional cost of composite construction has given the 1,500-foot Burr Oak Avenue Viaduct in Blue Island, Ill., a greater load-carrying capacity.

The main reason for the reconstruction job was the deterioration of the 7-inch-thick roadway, but undesirable vibration and live-load deflection also played a part in the decision to rebuild. The steelwork was structurally adequate. Bonding of the new concrete slab to the steel beams reduced vibration and deflection.

If replacement of the concrete had not been necessary, it would have been more economical to weld cover plates to the bottom flanges of the beams. This would have increased steel stiffness, but it probably would not have reduced vibration as much as the composite construction did.

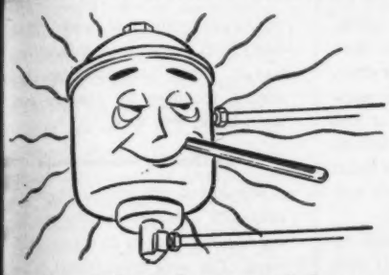
A total of 24,160 Nelson headed shear-connector studs, 4 inches long and ⅞-inch in diameter, were end-welded to the upper flanges of the bridge girders. Crews were able to work fast, using a Nelson NS-9 stud-welding gun with a Nelwelder 2000 power source. Studs were welded four in a row, with rows about 6 to 18 inches apart. Installation was handled at a rate of about three studs per minute.



This type of stud was used because it eliminated the possibility of warpage in the structural members—an effect sometimes encountered when prolonged arc time is required in the fillet welding of the structural shapes or other types of connectors. And there were other reasons. The end-welded studs simplified installation of sheer connectors near rivet heads on the plate-girder spans. Because they took up little space, they simplified the job of placing reinforcing, and they made it easy for workmen to get around during concrete placement.

Throughout the job, which was handled by States Improvement Co., Maywood, Ill., traffic was maintained on one-half of the bridge. When the job was finished, the viaduct had been given the physical properties of a new bridge, its AASHO load rating going from H18-S15 to the equivalent of H20-S16.

trim maintenance costs



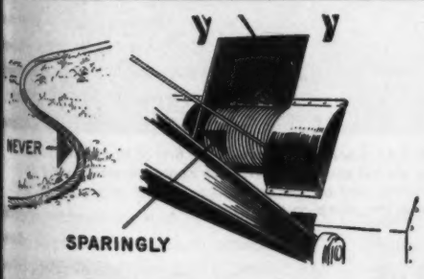
A filter that's working runs a temperature

Oil filters last so long these days it's sometimes hard to say when they were last changed. But they're so important to engine performance that it's essential that you know whether they're too full to filter right. Here's a simple way to find out.

A filter that's working will be as warm as the engine oil. If the filter on a fully warmed-up engine remains cool to the touch, it's a safe bet that it's too clogged up to let any oil through. Just to double-check, tap the filter case sharply. A metallic ringing sound means the cartridge is still in good shape. A soggy thud often means that the filter is loaded. Top mileage for even the best filter is 5,000 miles, never more.

Crawler treads are happier dry

There are few places where good lubrication is more important than in track-roll bearings, but make sure you don't lubricate the crawler treads themselves in a burst of enthusiasm. The pins that connect the links of crawler treads are designed to operate without lubrication, because dirt or other abrasives would act as a lapping compound in service. Result: much shorter service life for the track. Moral: if you don't want to lap your crawler link pins, don't oil them.



How often should you lubricate wire rope?

How much lubrication is good for wire rope and cable depends mainly on how it's used. Cables that are dragged in dirt shouldn't be lubricated at all. Oil simply holds the dirt where it can work into the strands and cause rapid wear. Cables that are wound on drums equipped with clutches should be lubricated sparingly to prevent fouling the clutch faces with lubricant. With other wire ropes, apply Texaco Crater A every 10 to 40 hours as necessary to avoid dryness. Be sure to clean the rope before adding new lubricant.

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The biggest problem for Flenniken Construction Co., Dallas, Texas, in laying reinforced asphalt pavement near Houston, is making the wire mesh lie flat atop the first 1-inch course. Here, a roll of mesh has been laid out by a Chevrolet 2½-ton tractor, which applies initial tension. A Hydralift holds the next roll.

Workmen cut wire from the contractor-built reel after a second truck, not visible here, rides onto the mesh to hold the tension. The reel is made of two long sections of pipe—one going through the roll and the other outside—connected by two short 3-inch pipe sections. Chains tie the reel to the truck.

Waves in the mesh are cut and the free ends of the wires overlapped while the mesh is in tension. This cuts down on cracks developing over old breaks, reduces sealing needed, and makes for a smooth riding surface.

New ways being worked out to lay

Reinforced asphalt pavement

Contractors and Engineers staff article

Reinforcing asphalt pavement with wire mesh demands skill and ingenuity.

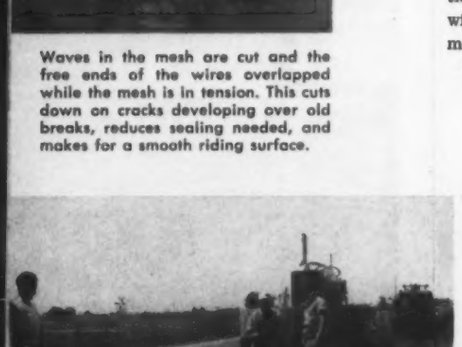
Since the method is unfamiliar to most contractors, they must devise new construction techniques. They must get the job done for the least money and still meet state specifications. In general, they have to work with conventional bituminous equipment.

The chief problem is getting the rolls of wire mesh to lie flat and at an even tension on top of the first course of asphalt. Unless this is done, the second course will contain pop-ups caused by the humping of the mesh. In these spots, the second course has to be chipped out by hand and later patched—an expensive and time-consuming operation.

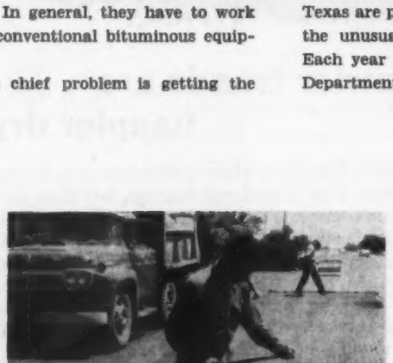
Bituminous paving contractors in Texas are perhaps most familiar with the unusual construction technique. Each year the Texas State Highway Department lets several contracts for reinforced asphalt pavement. In the past, both continuous rolls of reinforcing mesh and individual mesh similar to those for concrete pavement have been used.

Reinforcing reduces cracks

Reinforced bituminous paving is generally specified for the resurfacing of badly broken up concrete highways. The wire mesh tends to hold the asphalt together, and reduces the number of cracks that develop over the original breaks in the concrete.



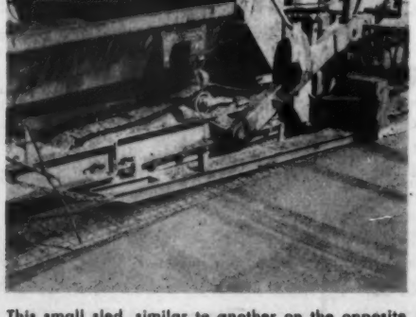
About 200 feet ahead of the finisher, a Ferguson self-propelled roller anchors a come-along chained to a pipe under the mesh. The pipe has rivets to grip and pull against transverse wires.



Ahead of the finisher, workmen with contractor-made crimping tools put additional tension on the mesh. The tool has two fingers at the base for twisting the wires.

A tack of RC-2 oil is sprayed on top of the first of three courses before the 1½-inch second course is laid. Tack coats were also used on the original concrete and on the second course. An International U120 engine powers the pump on the distributor.

At the start of a new run, the Pioneer Vibromatic finishing machine prepares to pick up a contractor-made sled that, along with a sled on each side, helps hold the mesh flat ahead of the screed. The center sled, of 3-inch I-beams, is chained to the front end of the rig.



This small sled, similar to another on the opposite side of the finisher, holds wire down and keeps the mesh from popping up in the freshly laid course. This sled also is dragged by a chain.

Pops-up occasionally occur. These are chipped out and patched, for the second course will not be bonded to the first. It's time-consuming and costly, but a must.

The reinforcing does not eliminate the cracks, but it reduces their number considerably. This provides a smoother riding surface and cuts down on the amount of sealing that has to be done with liquid asphalt.

Flenniken Construction Co. of Dallas tried its hand at a reinforcing job. It was a first try. At first the results were discouraging, but after the men developed a suitable technique for laying the mesh, the work went along smoothly. Flenniken subcontracted the paving from the general contractor, Century Construction Co., Houston.

The job involved the widening and resurfacing of 11.4 miles of badly cracked 20-foot × 6-inch concrete pavement on State Route 35 between Alvin and Pearland, not far south of Houston. The highway was sufficiently widened with a 14-inch cement-stabilized base to give two 12-foot traffic lanes bordered by 10-foot asphalt shoulders. Only the traffic lanes were reinforced.

Mesh between first two courses

The center 24 feet of asphalt was laid down in three courses, with the mesh between the first and second courses. Tack coats of RC-2 asphalt were sprayed on top of each successive layer, including the surface of the concrete road. The first course contained 100 pounds of asphalt per square yard, yielding a thickness of about 1 inch; the second course, with 150 pounds per square yard, was 1½ inches thick; the finish course, with 100 pounds per square foot, was 1 inch thick.

The reinforcing was a 10-gage 2 × 6-inch welded-wire mesh. It arrived on the job in 300-foot-long rolls about 12 feet wide.

By trial and error, the contractor worked out a system for laying the mesh that caused a minimum of pop-ups. The key to the system was keeping the mesh flat and at an even tension on the surface of the first course of asphalt. This was not easy.

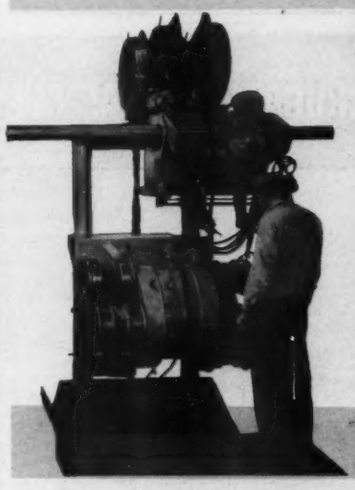
A truck first distributed the rolls at about 300-foot intervals along the edge of the highway. Each roll was connected to the previously laid mesh by overlapping the free ends of the wires. A contractor-built reel held the roll as it was pulled forward and unrolled by a Chevrolet 2½-ton truck. The reel, pulled on the ground behind the truck, was a simple device made of 3-inch pipes. One of the pipes penetrated the hole in the roll, while the second remained outside. The pipes were connected to each other by short pipes with eyes at their ends. Chains tied the reel to the truck.

At the end of each roll, the truck tugged on the 300-foot length of mesh. This tension was held by a second truck that drove up on the mesh just behind the first truck. With the second truck holding the tension on the mesh, men cut the wire free from the reel and tied in another roll. This operation kept

(Continued on next page)

For more facts, use Request Card at page 18 and circle No. 255 ▶

The Cedarapids 4,000-pound batch plant that supplies the job loads a Marion body on a Ford tandem truck. The truck at right receives oversize material from the vibrating screens.



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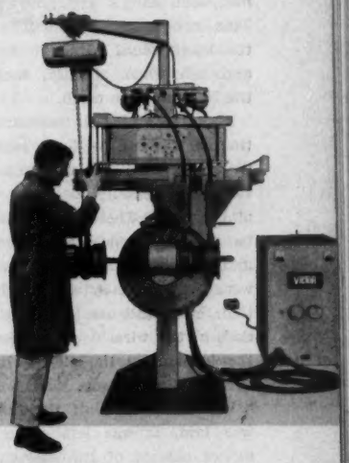

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(*Continued from preceding page*)

about 600 feet ahead of the finishing machine.

Final tensioning

Additional tension was applied to the mesh about 200 feet ahead of the finishing machine. At this point, a Ferguson self-propelled rubber-tire roller was stationed on the mesh. It acted as an anchor for a come-along that pulled on a bar gripping the mesh. The bar consisted of a pipe with rivets welded to it on about 1-foot centers. The rivets acted as fingers that grabbed the tranverse wires in the mesh. The pull was limited to the amount of stress that the welded joints of the mesh could take. Too much pull on the bar broke the joints.

Further tightening of the mesh just ahead of the finishing machine was accomplished by several workmen, each using a "crimping wrench." This contractor-built tool grabbed the longitudinal wires in the mesh and bent them slightly, shortening the length of the mesh.

Between the initial tensioning with the truck and the final tensioning with the come-along, humps or waves occasionally rose on one side of the mesh. These were believed to be caused by irregularities in the manufacture of the mesh. The waves were eliminated by cutting them at their crest and overlapping the free ends of the wire. A come-along held the tension on the mesh while the new joint was made.

When the mesh of the first lane was laid, it was left extending 6 inches outside of the asphalt. This allowed the mesh of the second lane to overlap the mesh of the first lane at the center joint. The 6-inch overlap was tied together by bar ties.

Why tensioning?

The purpose of the complicated tensioning process is primarily to get the wire to lie flat on the pavement. The tensioning also compensates for the expansion of the wire mesh when it is hit by the hot asphalt. When the hot-mix is placed, the mesh tends to pop up. When the mesh is under tension, this effect is reduced. Although the tensioning process resembles the prestressing of concrete, the strength added to the asphalt pavement by the tension in the wires is negligible.

Sled attached to finisher

A contractor-built device, attached to the Pioneer Vibromatic finishing machine, further assisted in holding the wire mesh flat on the pavement. Essentially, the device consists of three sleds resting on the mesh beneath the hopper of the finishing machine. The 9-foot-long sleds, pulled by the finishing machine, were made up of 3-inch I-beams. One large sled was pulled between the tracks of the machine; a smaller sled was pulled along outside of each track.

In general, the hotter the mix from the plant, the more likelihood there was of getting pop-ups behind the finisher. The excess heat caused the mesh to expand, resulting in a breaking of the bond between the two courses. It was found that the best temperature for the mix at the finisher was from 260 to 280 degrees F.

Rolling of the 1½-inch course topping the mesh was handled in the conventional way. An Ingram 3-wheel 10-ton roller worked on the breakdown, and an Ingram 10-ton tandem finished the rolling job.

Pop-ups are problem

Even though great care was taken in tensioning and smoothing the mesh, it was impossible to avoid some pop-ups. Later, these had to be cleaned out with pick and shovel and patched. The final 1-inch course was then put down in the conventional way.

Most of the pop-ups, however, were caused by the tracks of the asphalt spreader catching the wire and pulling it above the surface. But this trouble was taken care of by turning the tracks around on the machine.

The cost of supplying and placing the wire mesh was indicated by the bid price of 40 cents per square yard. The bid price for the 38,000 tons of asphalt on the job was $6.50 per ton or $1.14 per square yard for the 3½-inch-thick traffic lanes.

Hot-mix was supplied to the job by a Cedarapids 4,000-pound batch plant. The portable plant was equipped with three cold-feed control bins. Normal production was 100 tph.

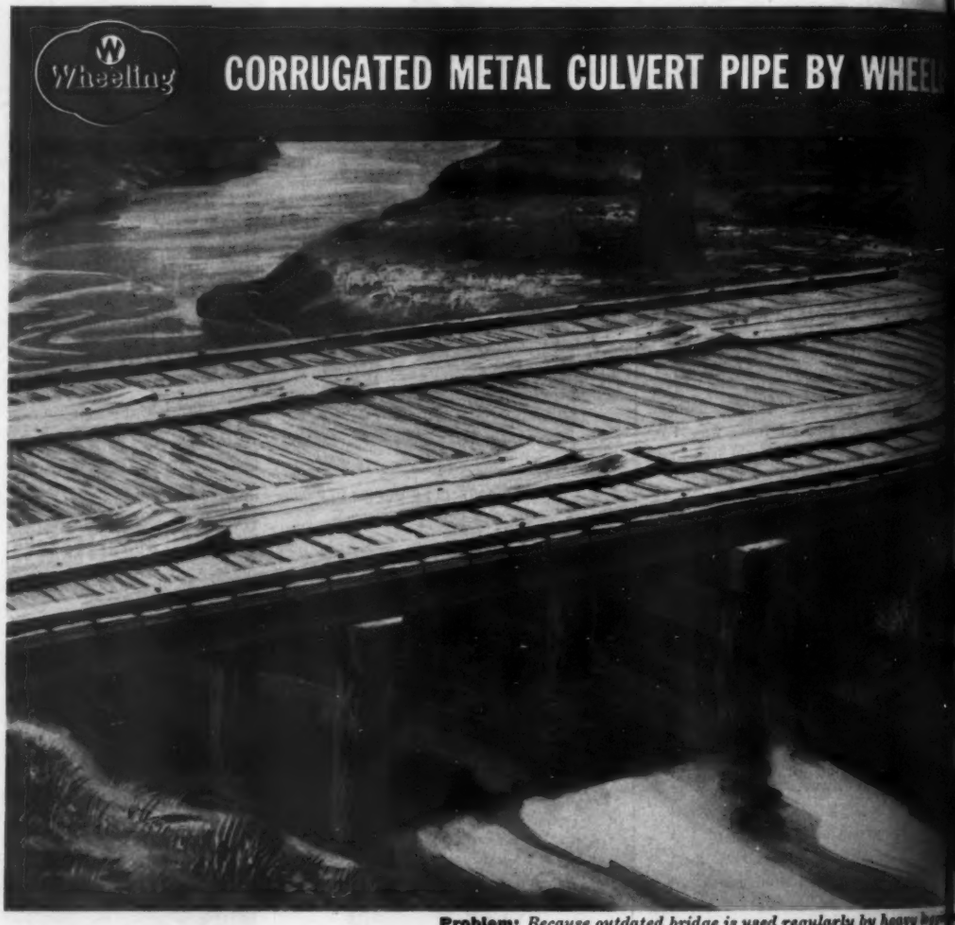
The mix for each of the three courses was identical. Aggregate was composed of 30 per cent ½-inch washed gravel, 38 per cent ¼-inch washed fine oyster shell, and 28.2 per cent sand. Mixed with the aggregate was 5.8 per cent OA 90 asphalt.

Personnel

C. D. Shoffit superintended the job for Flenniken Construction Co. For the state highway department, G. W. Callihan is senior resident engineer, and Martin Andrisek is chief inspector. THE END

Nevada department names maintenance engineer

Assistant Division 2 engineer, H. A. Squires of Reno, Nev., has been made chief maintenance engineer for the Nevada Department of Highways. He replaces Joseph D. Meacham, who has retired.



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Labor Review

Construction slowed down by five striking trades in New York City area

Strikes by five specialty trades, which began July 1, continued to slow down construction in the New York City area.

The Mechanical Contractors' Association of New York, meanwhile, attempted to break one of the bargaining stalemates with a quarter-page ad in the *New York Herald Tribune* asking, "Are 4,000 Highly-Paid Steamfitters Going to Shut Down New York City?" The ad contained a reprint of a letter from the association to members of the striking union reviewing the negotiations in which the steamfitters rejected the 70-cent, 3-year offer accepted by the major crafts.

Sheet-metal workers, asbestos workers, and laborers (ready-mix) also walked out on July 1, and were joined two weeks later by ornamental iron workers.

Building tradesmen average 14.6 cents hourly in 1960 settlements

Building tradesmen, maintaining their long-established lead over other groups of employees, racked up an average 14.6-cent increase in hourly wages over the first half of this year, according to new contracts reported during the 6-month period by Construction Labor Report.

Based on the January–June data, unions are doing a little better for their members than they did in the previous two years. Averages for 1959 and 1958 were 14.3 cents an hour and 14.5 cents an hour, respectively. The banner year, however, still is 1957 when hourly raises averaging 16.1 cents an hour were negotiated by construction unions.

As in past years, 15 cents an hour is the most popular settlement figure. About one-third of the agreements concluded during the first six months provided immediate pay increases of 15 cents an hour. Almost half—45 per cent—of the contracts, however, were settled for less than 15 cents, and 10 cents was the second most popular figure, appearing in about one-fifth of the agreements.

One-year agreements—once standard in the industry—continue to give ground to long-term contracts. About two-thirds of the 359 agreements reported during the first half of 1960 remain in effect for longer than a year. A 2-year duration is specified in 148 contracts; 70 run for three years: seven continue into 1964; and six are written for a 5-year term.

Only in the South does a majority of new contracts run for only a year. Of 68 settlements reported in southern states, 36 of the agreements expire next year, 22 continue into 1962, eight are effective until 1963, and two run until sometime in 1964.

Utah carpenters approve 3-year settlement, accept 50-cent package

Wage rates went up 10 cents an hour as of July 18 under a new agreement between the Intermountain Branch of the Associated General Contractors of America and the Utah District Council of Carpenters.

The 10-cent raise is the first installment on a 3-year, 50-cent package. Rates will be increased another 10 cents on June 1, 1961; 10 cents more, January 1, 1962; and 10 cents again, June 1, 1962. The remaining 10 cents comes as a health-welfare contribution to begin January 1, 1961.

The journeyman rate under the old contract, which expired May 31, was $3.15. Foremen are paid a 25-cent differential.

Boston bricklayers sign 3-year agreement to end 60-day strike

Boston bricklayers accepted a 3-year agreement, providing immediate increases of 25 cents hourly in wages and 5 cents in pension contributions, to end a 60-day strike against the Associated General Contractors of Massachusetts and the Boston Building Trades Employers Association. The new $4.05 hourly rate was retroactive to May 1; the 20-cent pension contribution to July 5.

Northern Indiana carpenters reject 2-year package, continue strike

Northern Indiana carpenters, off the job since July 1, rejected a proposed 2-year 37½-cents-an-hour package and sent union negotiators back with a renewed bid for a one-year contract.

The rejected contract was proposed by the Northern Indiana Home Builders Association, the Associated General Contractors of the Calumet Region, and the Industrial Contractors and Builders Association. The contractors' proposal called for a 15-cents-an-hour wage increase, retroactive to July 1, 1960; 10 cents more on January 1, 1961; and a final 12½ cents on July 1, 1961. The old wage rate was $3.82½ an hour, plus 7½ cents for health-welfare coverage.

The union wants a 27½-cents-an-hour increase and a one-year agreement. It claims to have signed with some 150 independent contractors.

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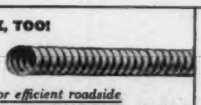

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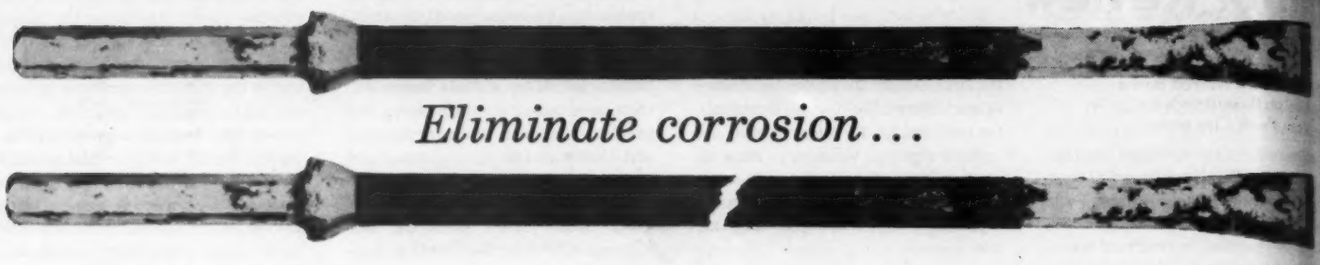

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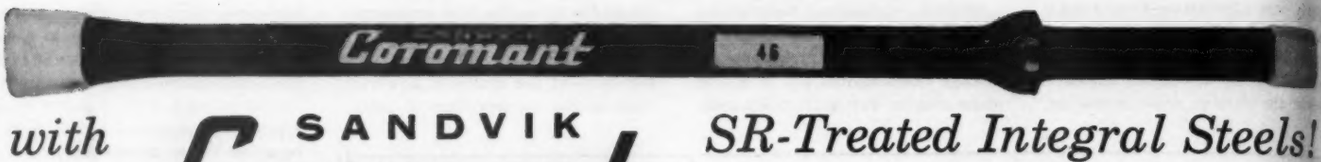

with **SANDVIK Coromant** *SR-Treated Integral Steels!*

- Corrosion promotes breakage: You know, of course, the variety of mechanical stresses to which steels are subjected in work. Stresses cause fatigue; can cause premature rod breakage, before the normal tensile strength or even the yield point has been exceeded.

In most cases, fatigue failure starts from the point where corrosion has set in. In other words, corrosion sets up the conditions for a fatigue break to occur. Except—when you use Sandvik Coromant Integral Steels! The exclusive Sandvik SR-treatment* protects against corrosion and provides from 30 to 50% longer life than untreated steels.

You get other advantages too: Less loss of energy, since the bit is integral with the steel. There is no bit to "get lost". What's more, since Sandvik is one of the world's largest manufacturers of tungsten carbide, you get bigger and better inserts.

Sandvik Coromant Integral Steels are available from 1" to 1¾" bit diameter, in ¾", ⅞", and 1" hexagonal steel section.

Write today for complete information. Address: Dept. CAE-15.

Appearance of a fatigue breakage that often arises with rods that have not been protected against corrosion. Sandvik's SR-treatment* protects against such failures.

*pat. pend.

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San Carlos, California
LYtell 1-0375

For more facts, use Request Card at page 18 and circle No. 257

Stainless steel placed as skin for movable dome of new Pittsburgh arena

■ Stainless-steel roofing sheets are now being installed on the huge movable dome of the Pittsburgh Public Auditorium.

The structure of the dome (See "Pittsburgh Public Auditorium Takes Shape in Concrete, Steel," C&E, February, 1960, page 24) consists of two stationary leaves and six that rotate around pins at the top of the dome as they roll on curved base rails. The main support of the roof is a cantilever frame constructed of a box girder 8 feet wide and 17 feet 6 inches deep. A system of tie-back members extends from the girder anchorage point near the ground line almost to the top of the dome.

Limbach Co. of Pittsburgh, contractor for the roof skin and closures, is fabricating and erecting the stainless steel sections, which are sheets of 20 and 22-gage Type 302 stainless steel with a 2D special finish. The sheets are notched, sheared to size, and brake-formed at the edges. The formed sections are applied over a base of roofing felt and insulation.

Why good highways? Iowa Mfg. lists reasons in promotion folder

■ "Why do we need good highways?" is a 4-page folder with enough ammunition to mow down the toughest opponents of new highway construction. Sponsored by Iowa Mfg. Co., Cedar Rapids, Iowa, as a public service, it is being distributed nationally by insertion in magazines.

The folder lists 43 of the many reasons why better highways are a necessity at this time.

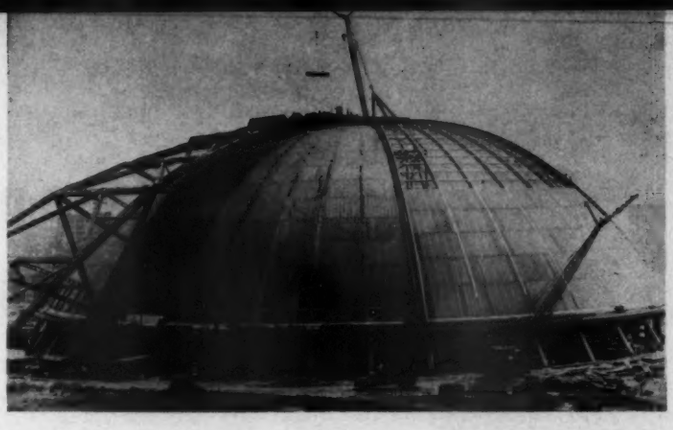
The arguments are backed up by statistics. Interstate highways, for instance, would be expected to save $3 billion annually in vehicle operation, traffic accidents, and time lost by commercial vehicles.

With improved roads, the accident death rate is expected to decline from 5.8 per 100 million miles in 1958 to 4.4 in 1975.

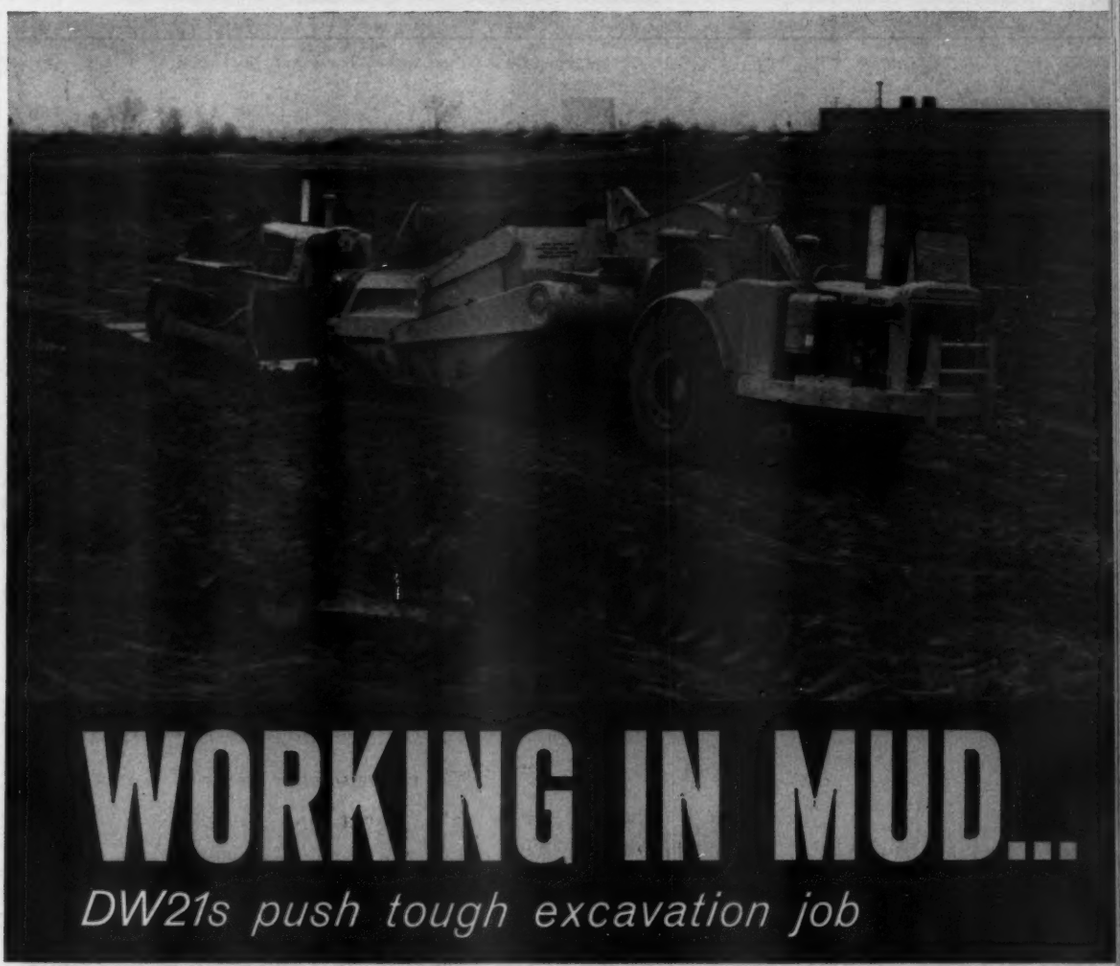
The folder also explores the role of modern highways in the economic sphere, citing specifically the contribution of highway construction to the gross national product and showing how the New York Thruway stimulated $650 million in construction.

The importance of the network of superhighways to defense is emphasized by references to their relative invulnerability to atomic attack, and their importance in the swift movement of military supplies, equipment, men, food, and medicine. The report also points out that the extra $400 million spent on highway contracts in 1958 helped break the back of the recession.

Everything is summed up in the last reason for securing enthusiastic public backing for better roads: "Modern highways are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future."



The first stainless-steel sheets now are being installed on the giant movable dome of the Pittsburgh Public Auditorium. When the job is finished, the entire roof—136 feet high and 415 feet in diameter—will be sheathed with some 7,580 sheets of stainless steel.



WORKING IN MUD...

DW21s push tough excavation job

Put yourself in the shoes of Grantwood Construction Co., Kirkwood, Missouri. The job—excavate 425,000 cu. yd. for the River Roads Shopping Center, St. Louis. Average haul distance—900-ft. round trip.

Here's the dark side of the picture. Bad weather turned the silt and clay into heavy, slippery muck. And the rains continued, throughout the spring.

Adverse conditions? Definitely! But the two DW21Gs took them in stride, moving big loads over soft ground.

Three features on the DW21G paid off big:

SYNCHROTOUCH TRANSMISSION CONTROL: It lets the operator shift simply by dialing the desired gear for automatic, split-second response. Result: faster shifting, faster cycles, more payloads per hour, less operator fatigue for higher daily production.

POWER: DW21G is rated at 345 HP (maximum output) . . . plenty of power to get heavy loads out of the cut . . . hustle them over soggy ground.

GOOD FLOTATION: Wide-base tires on tractor and matching 470B Scraper carry big loads over ground that bogs down other rigs. 470B is rated at 19.5 cu. yd. struck . . . 27 cu. yd. heaped. Other features add up to lower maintenance cost; longer, more productive service. For example, strong bowl, draft frame and apron shrug off the punishment of heavy loads.

The DW21G delivers top performance on any job . . . especially the tough ones. Your Caterpillar Dealer has complete details on this versatile scraper combination. Ask him to demonstrate its profit potential on your job.

Caterpillar Tractor Co., General Offices, Peoria, Ill., U.S.A.

CATERPILLAR

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WANTED—
THE HARD WORK

For more facts, use Request Card at page 18 and circle No. 258

Drilling is handled by Gardner-Denver Air Tracs in a granite cut along the alignment of the U. S. 3 relocation near Chelmsford, Mass. Some 12,000 yards of excavation is being done daily.

Three-pronged fleet moves rock earth borrow

Contractors and Engineers staff article

A 3-pronged equipment fleet—for rock, earth, and borrow excavation—is handling more than 12,000 cubic yards of material in a 10-hour work-day to make grading of a 4-mile reconstruction of U. S. 3 near Chelmsford, Mass., a smooth operation.

M. A. Gammino Construction Co., Providence, R. I., is the contractor on this $4,600,000 job, which includes moving over 500,000 yards of rock, 550,000 yards of earth, over 1,300,000 yards of borrow, and 175,000 yards of muck excavation.

Gammino is using 8 Gardner-Denver Air Trac drills to sink the 3½-inch-diameter blast holes into the tough granite scattered throughout the job. The deepest cut along the alignment is in solid rock and measures 35 feet in depth.

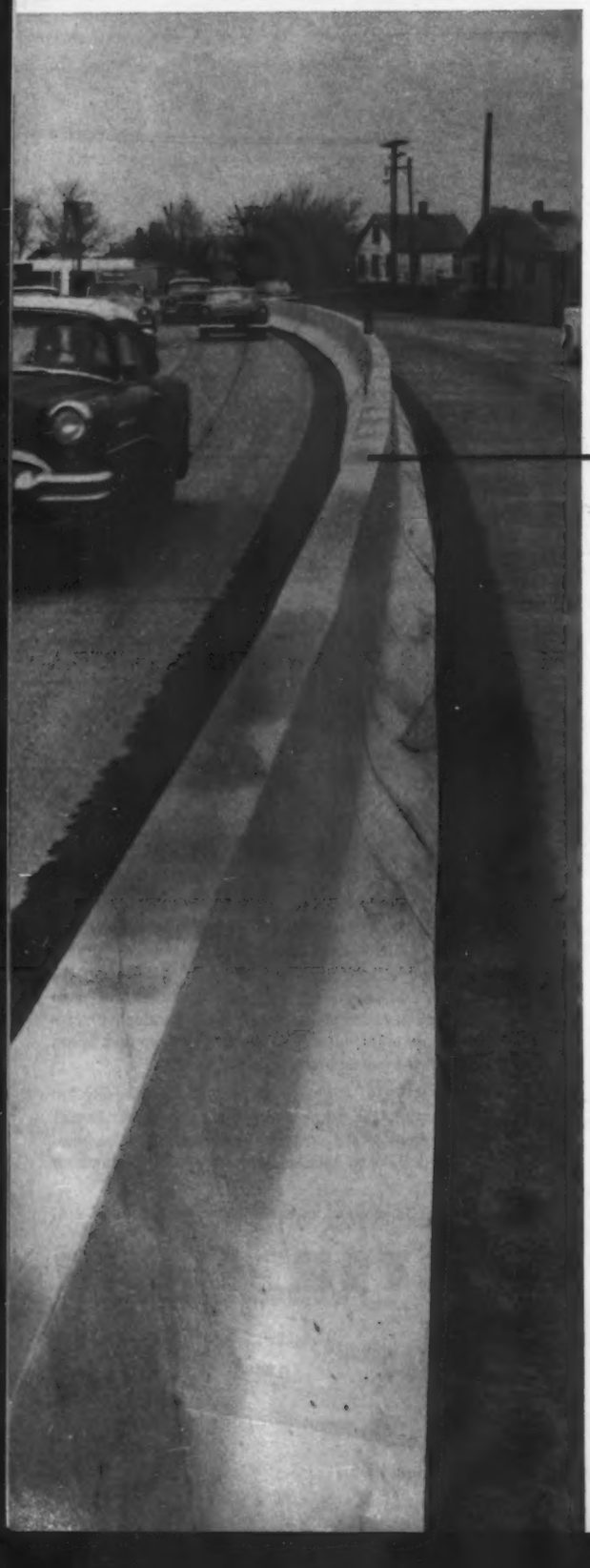
Using a 5×6-foot spacing, the contractor is sinking the blast holes to the full cut depth and blasting without delays. This is possible because the new route is in open country.

Generally, Gammino is sinking the blast holes to a point 3 feet below design subgrade elevation to make sure that enough rock is removed and to make sure that the roadway grade will be built up properly. American and Du Pont 60 per cent dynamite is being used to handle the blasts.

For the 35-foot cut, the contractor is sinking 35-foot holes and loading

A Lima 3-yard crane with clamshell bucket excavates blasted rock from a drainage ditch through the rock cut.

For more facts, use Request Card at page 18 and circle No. 259



Unretouched photo of concrete barrier taken last spring following a severe winter.

White concrete center barriers: new safety for existing roads

This concrete center barrier on Route U.S. 46, New Jersey, has been successful in preventing head-on collisions on this heavily traveled approach to the George Washington Bridge. Cast in place with ATLAS WHITE portland cement, the barrier is 32 inches high, 24 inches wide at the base, with sloping sides. This design minimizes the possibility of vehicles mounting the barrier and helps shield oncoming headlights. This construction has become an important feature in New Jersey's program to build safety into existing highways where the installation of center islands is impractical.

ATLAS WHITE air-entraining portland cement was specified for the concrete in this installation because its uniform whiteness provided contrast between barrier and the darker pavement. And at night, this contrast is even more apparent. In addition, the air-entraining property of this cement also provides a more durable concrete that resists the destructive effects of freezing-thawing weather and the application of deicing salts. For more information on white portland cement, write Universal Atlas, 100 Park Avenue, New York 17, New York.

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Universal Atlas Cement Division of United States Steel

USS

Shovel loading is a job for a Bucyrus-Erie 71-B with 3-yard bucket. Euclid end-dumps haul the material to the many fill areas along the project. Total rock excavation comes to more than 500,000 yards.

Scraper operations are taking care of the roadway excavation on the job. The Allis-Chalmers scraper is pushed by a Cat D9. Borrow pits supply the 1,300,000 yards of fill needed for the two 24-foot roadways.

them up to 6 feet from the top, or 29 feet of the hole. Electric blasting caps set off the charges.

Shovel fleet

Two P&H 1055 shovels equipped with 3½-yard buckets load the blasted rock into a dozen Euclid rear-dumps. This material is used in the many fill areas along the job.

After the rock excavation is completed, the two P&H shovels will be shifted into the borrow pits, together with the Euclid rear-dumps, to assist the Bucyrus-Erie 71-B 3-yard and the Northwest 80-D 2½-yard shovels in the borrow excavation. A total of 6 borrow pits will be required to supply the 1,300,000 yards of fill.

Scrapers also used

Six scrapers, four Allis-Chalmers 30's, and two Caterpillar DW21's handled the roadway earth and borrow excavation.

Assisting in the push-loading of the scrapers, as well as the shovels, are six Caterpillar tractor-dozers—a D9 and five D8's. Equipment for other assignments includes a Lima 3-yard dragline for peat excavation, a Northwest 1¼-yard crane to handle the bridge and culvert work, and a Northwest 1-yard backhoe for the drainage and structure foundations.

When completed, the new route will extend an already reconstructed portion of U. S. 3, which eventually will tie into New Hampshire's Everett Turnpike. It will consist of two 24-foot asphaltic-concrete roadways having outside 10-foot paved shoulders.

Personnel

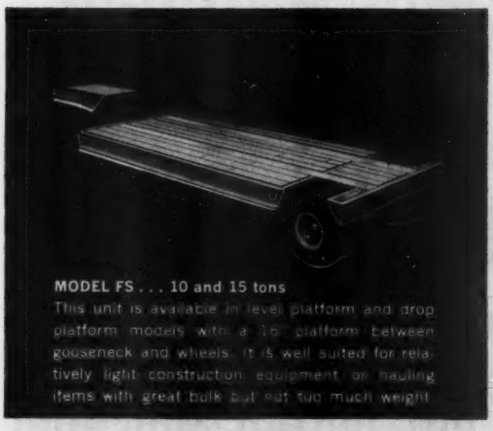
Jack Ramos is the superintendent for Gammino, and Dante Bartolomeo is the resident engineer for the Massachusetts Department of Public Works.

THE END

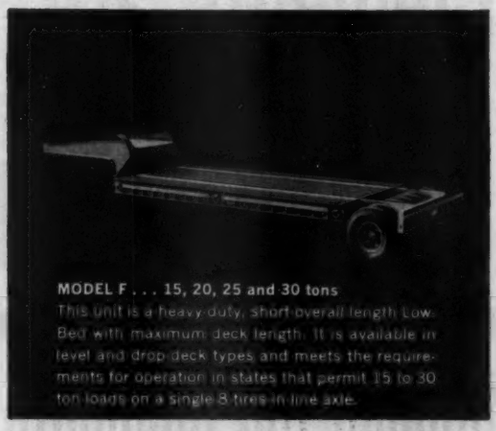
Goodrich building new tire plant

The B. F. Goodrich Co., Akron, Ohio, is currently constructing its fourth tire-manufacturing plant in the United States near Fort Wayne, Ind. The new plant, scheduled for completion late next year, will also be the thirty-fifth Goodrich manufacturing operation in the country.

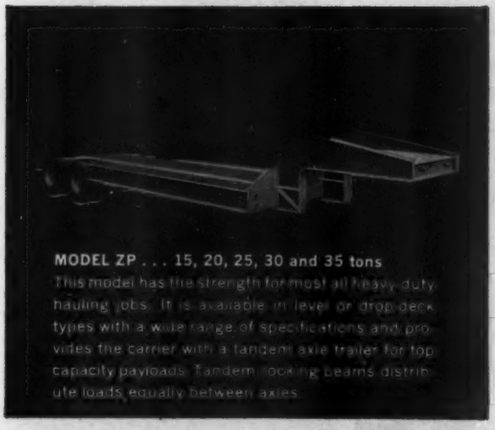
for 'heavyweight' hauling jobs
TRAILMOBILE LOW-BED TRAILERS



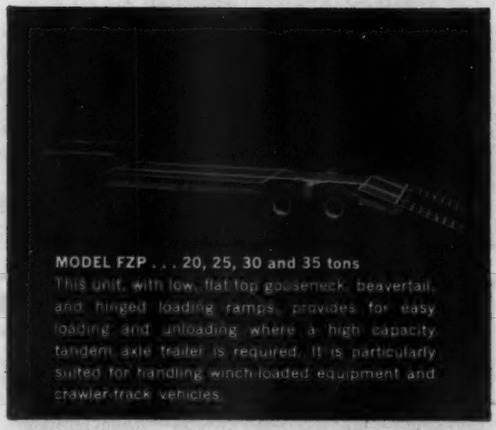
MODEL FS . . . 10 and 15 tons
This unit is available in level platform and drop platform models with a 16' platform between gooseneck and wheels. It is well suited for relatively light construction equipment or hauling items with great bulk but not too much weight.



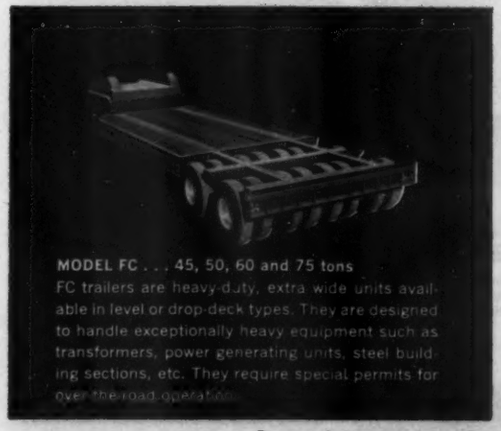
MODEL F . . . 15, 20, 25 and 30 tons
This unit is a heavy duty, short overall length Low-Bed with maximum deck length. It is available in level and drop deck types and meets the requirements for operation in states that permit 15 to 30 ton loads on a single 8 tires in line axle.



MODEL ZP . . . 15, 20, 25, 30 and 35 tons
This model has the strength for most all heavy duty hauling jobs. It is available in level or drop deck types with a wide range of specifications and provides the carrier with a tandem axle trailer for top capacity payloads. Tandem rocking beams distribute loads equally between axles.



MODEL FZP . . . 20, 25, 30 and 35 tons
This unit, with low, flat top gooseneck, beavertail, and hinged loading ramps, provides for easy loading and unloading where a high capacity tandem axle trailer is required. It is particularly suited for handling winch-loaded equipment and crawler-track vehicles.



MODEL FC . . . 45, 50, 60 and 75 tons
FC trailers are heavy-duty, extra wide units available in level or drop-deck types. They are designed to handle exceptionally heavy equipment such as transformers, power generating units, steel building sections, etc. They require special permits for over-the-road operation.

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TRAILMOBILE INC.
CINCINNATI 9, OHIO

Please send me a folder describing your complete line of Low-Bed trailers.

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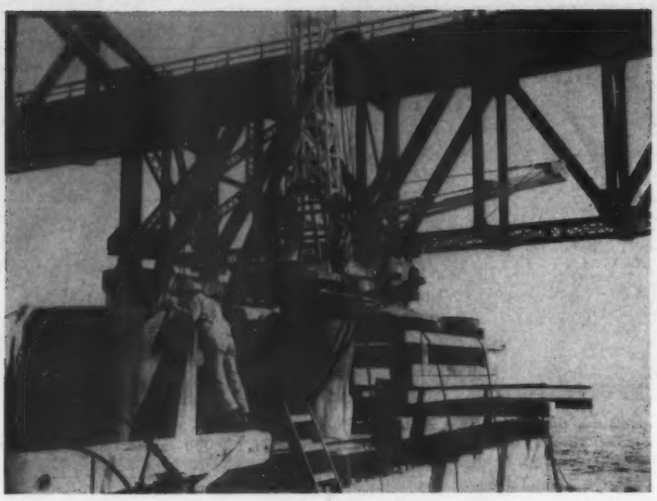
For more facts, use coupon or Request Card at page 18 and circle No. 260



A modified Calweld 200-A drill rig excavates inside an 80-inch casing for foundations for the Martinez-Benecia Bridge piers in San Francisco Bay. Drilled material is pumped to the surface and discharged through a hose line; a deck pump replenishes water in the casing.

Substructure work for bridge put ahead of schedule as

Modified drill rig sinks big caissons

A new reverse-circulating rotary drill rig, working from a barge to drill substructure foundation caissons, has chopped months off the time it would ordinarily take for work on the Martinez-Benecia Bridge on San Francisco Bay.

There are several advantages to the drilling. Buried logs, debris, and the solid rock foundation forming the bed of the river were no problem with the method. With controlled drilling, caissons go down straighter than would otherwise be possible. And drilling is a safer method than the one proposed originally.

Channel deep, currents fast

The new bridge, with nine river piers that make it similar to a railroad span it parallels, has a 6,200-foot-long main portion crossing the Sacramento River estuary at the upper arm of the bay. Here, wind, tide, and tricky currents add difficulties to the tough job of putting down the foundation caissons.

The state's method of construction, suggested in the plans, was simply this: Construct cellular-type concrete shells, ashore or in drydock, that are 86 feet long, 44 feet wide, and 25 feet deep. The hollow cells are positioned to locate automatically ten 72-inch-diameter caissons. The two inshore piers have eight caissons each. These caisson foundation shells, some of them up to 130 feet long, are then sunk, by a combination of jetting and driving, through sand, mud, gravel, and debris to bedrock.

Change in method

The contractor on the job, Yuba Erectors—a division of Yuba Consolidated Industries, and formerly known as Judson-Pacific-Murphy—wanted a better method. The firm, which had built the Richmond-San Rafael Bridge nearby in a joint venture with Peter Kiewit Sons' Co., knew some of the problems presented by the bay floor.

The state's basic idea of floating in precast shells, putting caissons down through the cells, and then placing concrete so that shells and concrete barge formed a pile cap was retained. The big change was in the method of putting down the caissons.

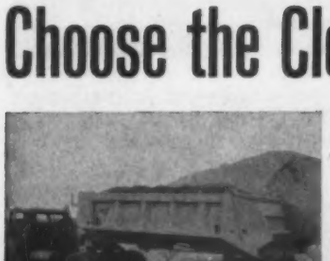
Yuba's project manager Bill Ziegler,

Clements are "Job Matched"

IN CAPACITY, WEIGHT AND PRICE

for Profitable Hauling

Choose the Clements that Match your Job



The Speed Hauler

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Carries more 10-yard payloads a day with faster round trips . . . reduces pounding and wear on light return runs, lowers deadhead costs . . . ideal short-coupled unit for close quarter operations and fast spotting.

The Round Tripper

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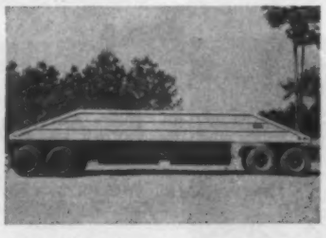
Versatile, 14-yard capacity hauler maintains top efficiency over wide job range . . . recognized as the standard of the industry from coast to coast and in many foreign countries. High sides prevent spillover on area dump operations.

The Trail Buster

B-2218-TLH

Compact 18-yard trailer engineered to provide maximum flotation. Has unusual ability to pull through soft materials . . . carries big loads at high speeds . . . works when other big haulers are grounded.



The Slim Jim

WCD-3520-BDT

This 35′ unit moves maximum payload at high legal road speeds—clam shell type gate air operated permits easy, clean, dumping—through 60″ x 40″ gates.

Clement

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PLANT: Minden, Louisiana

For more facts, use Request Card at page 18 and circle No. 261

Drill stems are added to the Calweld 5½-ton rig, which was put to work with a heavy derrick. The kelly is a 6-inch hollow pipe with welded angle steel.

An 80-inch-diameter steel casing is set in position in one of the cellular-type concrete shells. The shells position ten caissons automatically.

Once the 72-inch caisson has been set in place, drilling carried 7 feet into rock, and reinforcing positioned, tremie concrete is placed.

A first-hand check on the rig is made by project manager Bill Ziegler, coordinator J. P. Murphy, and Calweld general manager S. L. Rose.

coordinator J. P. Murphy, and project engineer Al Tokola went to Calweld, Inc., Los Angeles, with a custom assignment. The company manufactures a line of rotary earth-boring drills for mounting on trucks, self-propelled crawlers, and cranes. Calweld's engineers took on the job of altering a machine so that drilled material in a fluid state could be removed from great depths by pump rather than being taken out by bucket.

Adaptation made

One of Calweld's standard 200-A drill rigs was first enlarged to take heavier loads than usual, and a heavier derrick was substituted. A new type of kelly, consisting of a 6-inch hollow pipe with angle steel welded to it, was built up. Air lines were installed on each 15-foot section. And a heavy-duty centrifugal pump was developed to remove the material.

A new type of drill bit was also built. It resembles the cutterhead of a dredge, with the auger and the H & L special teeth hardfaced with a covering of tungsten-carbide chips.

The finished rig is skid-mounted, weighs about 5½ tons, and can be lifted to drilling position by the 75-ton derrick barge. A Chrysler-driven American hoist delivers a single line pull of 7,000 pounds. The centrifugal pump is driven by a Continental engine.

Only one minor correction was made in the rig. The drive chain that powers the drill was doubled because

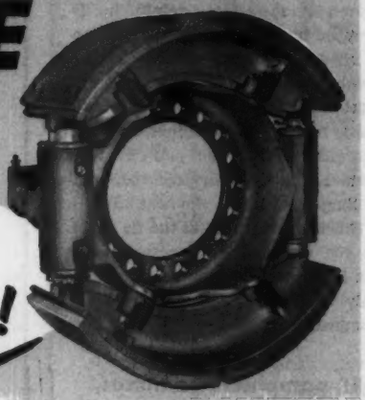
(Continued on next page)

This is the special drill bit developed by Calweld with H & L teeth hardfaced with tungsten-carbide chips. The auger is also faced with the same kind of chips.

It's here! New HEAVY-DUTY

STOPMASTER BRAKE

Biggest News in Brakes for Off-Highway Equipment in over 30 years!



To meet the growing need for more versatile, more compact, more dependable braking equipment in off-highway operations, Rockwell-Standard® now presents a completely new concept in brake design.

This new brake is specifically engineered for use on scrapers, prime movers, earth and rock wagons, dump trucks and similar construction vehicles. Available in 17, 20¼, 22 and 26-inch diameters and in 4 to 10-inch widths.

If it's a Stopmaster you get . . .

- Reduced Operating Cost
- Less Heat Fade
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- Adjustment frequency reduced
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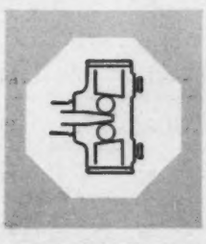


Only the Heavy-Duty Stopmaster offers:

"BALANCED DESIGN" AND NEW ACTUATION PRINCIPLE

Results in improved braking performance and lower operating temperatures. In Dual-Actuation design, both shoes do an equal amount of work. Balanced shoe-action assures more dependable service; faster, surer stops.

HYDRAULICALLY OPERATED

New hydraulic cylinders offer more compact design and increased mounting flexibility for better protection. External cylinders, located outside of drum, eliminate heat damage and overheating of fluid. For air-over-hydraulic systems, air volume requirements are considerably less. Actuation time is reduced, with faster response of hydraulic system. The Stopmaster Brake is well suited for straight hydraulic, air-over-hydraulic, or vacuum-over-hydraulic operation.

Another Product of...

ROCKWELL-STANDARD CORPORATION

Brake Division, Ashtabula, Ohio

For more facts, use Request Card at page 18 and circle No. 262

(Continued from preceding page)

of the strain on the single drive chain caused by high torque forces when the auger bit leaves overburden and hits rock.

The rig bores through about 6 feet per hour as its pump moves about 20 per cent solid material through the hollow kelly. Here's the sequence of operations: An 80-inch-diameter steel casing with ½-inch-thick walls is first set in position by the derrick barge until its point is well below the mud line. This casing is filled with river water by a deck-mounted 4-inch pump. The drill rig then bores down through the casing and beyond with a 78-inch bit. As material is dislodged, the reverse-circulating pump sends it to the surface to be discharged through a hose line over the side. Water removed by the pump is replenished by the deck pump so that the casing and the hole below are always under a full hydrostatic head of water that keeps the hole from caving. At bedrock, a 60-inch bit is substituted to carry 2 feet into solid rock.

When this has been done, a preassembled 72-inch steel caisson shell is set in place through the 80-inch shell by the derrick barge. The 60-inch bit then drills through the 72-inch caisson to penetrate 5 additional feet into bedrock. After the drill bit is removed, a cage of steel reinforcing is dropped into the rock and the caisson is filled with tremie concrete. Placement continues until the concrete level is far enough into the concrete barge so that it can be joined monolithically with the next pour. The 80-inch casing is then removed, and drilling is started on the next unit.

Officials estimate that the rig could go 400 feet deep, if necessary, and list its performance as being limited only by friction as the material is pumped out. THE END

HRB pamphlets on mixes, concrete and bituminous

■ "Temperature in Bituminous Mixtures" and "Physical and Chemical Properties of Cement and Aggregate in Concrete" are two new bulletins issued by the Highway Research Board.

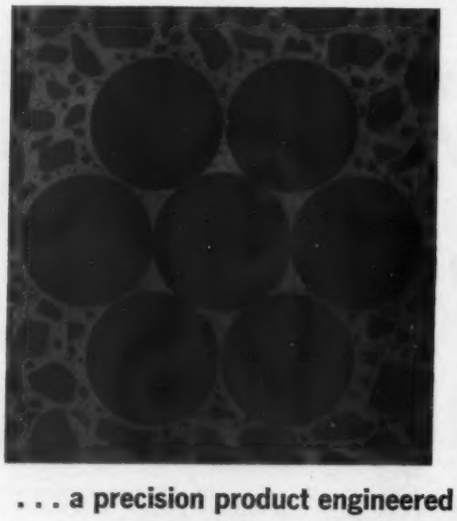
The first covers effects of aggregate temperature, temperature-viscosity relation of asphalts used in the U. S., effects of asphalt-cement viscosity at mixing temperature, effects of time and temperature on hardening of asphalts, and the effects of pugmill structure and the asphalt spraying mechanism on the mixing and properties of mixtures. This is Special Report 54 and it is priced at $1.

Bulletin 239, on concrete mixes, deals with pore-size distribution and other rock properties of carbonate aggregates, chemical and mortar bar tests for potential alkali reactivity, silification of carbonate aggregates, and cement-pozzolan reactions. The price of this bulletin is $1.20.

Copies of the bulletins may be ordered from the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

THIS PRIZE-WINNING BRIDGE, across the Squamscott River, is part of the 3.5-mile Exeter, N. H., bypass, which was formally dedicated September 1. The 3-span welded steel girder bridge won a $1,000 national bridge contest award for its designer, Robert J. Prowse, New Hampshire highway department engineer. The builder was E. D. Swett, Inc., Pembroke, N. H.

Paul Otis photo



J&L PRESTRESSED CONCRETE STRAN

. . . a precision product engineered for today's concrete-prestressing indu

Quality materials, modern equipment, and the expert craftsmanship of an experienced major steel company—Jones & Laughlin—guarantee prestressing strand to meet your most exacting requirements. All orders and inquiries receive prompt attention; write or call your nearest J&L District Office for additional information or price quotation.

PHYSICAL PROPERTIES AND LOAD TABLE

Strand Diam. (In.)	Wt. Per 1000' (Lbs.)	Approx. Area (Sq. In.)	Minimum Breaking Strength (Lbs.)	Loads at Following Percentages of Minimum Breaking Strength (Lbs.)		
				60%	70%	80%
¼	122	.036	9,000	5,400	6,300	7,200
5/16	198	.058	14,500	8,700	10,150	11,600
⅜	274	.080	20,000	12,000	14,000	16,000
7/16	373	.109	27,000	16,200	18,900	21,600
½	494	.144	36,000	21,600	25,200	28,800

Approximate Modulus of Elasticity: 27,000,000 psi.

Conforms to Designation: A

Member Prestressed Concrete Institute

"STRENGTH THROUGH STRESS"

TRENCHING FOR THE LOVERS LANE STORM SEWER project in northwest Dallas, Texas, is handled by the Austin Paving Co. of Dallas with this ¾-yard Lorain hoe. The machine uses a 39-inch bucket to advance 250 feet a day through hard clay and rock. The 3,000-foot ditch is 12 feet 6 inches deep and widens from 39 inches at the bottom to 50 inches at the top.

Michigan parts depot set up on West Coast

■ The Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich., has established a parts depot at South Eighth and Wright Avenues, Richmond, Calif., to speed delivery of infrequently used parts to Michigan owners west of the Rockies.

Several thousand parts not usually found in a distributor's inventory will eventually be carried in this plant, which is located in the San Francisco Bay area.

Books on stabilization, compaction, consolidation

■ Compaction, stabilization, and consolidation of soils are topics of three current Highway Research Board bulletins. One covers specific problems of consolidation as computed by a 1958 extension to the Terzaghi theory of consolidation of fine-grained soils. This bulletin, No. 248, is titled "Field Applications of Soils Consolidation: Time-Dependent Loading and Varying Permeability." It can be ordered for 60 cents.

"Water Tensions; Swelling Mechanisms; Strength of Compacted Soil" has papers on a device for measuring tensions in water, mechanisms of swelling by compacted clay, and the effect of rate of strain on the strength of compacted soil. The bulletin, No. 245, costs 80 cents.

Bulletin No. 241, "Soil Stabilization with Asphalt, Portland Cement, Lime, and Chemicals" has six papers on soil treatment with several types of agents. It costs $2.40. All bulletins may be obtained from the board's office at 2101 Constitution Ave., Washington, D. C.

Bucyrus-Erie introduces nuclear quality control

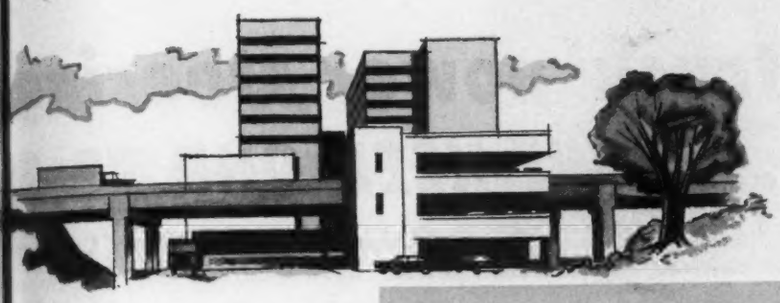
■ Bucyrus-Erie Co., South Milwaukee, Wis., manufacturer of excavating and drilling equipment, is using nuclear energy to improve its industrial quality-control program. Radiographic methods are used to check for defects in castings and welds.

In a special reinforced-concrete building, photographs are taken with isotopes of either radioactive cobalt 60 or iridium 192 bombarding the castings and welds with radioactive gamma rays. Defects show up as dark areas on the film.

Personnel changes for Roebling division

■ John H. Bass, Jr., has been made southeast sales supervisor, and Arnold S. Nelson, midwest sales supervisor for the Construction Materials Division of John A. Roebling's Sons, Trenton, N. J. The division specializes in tensioning materials for prestressed concrete.

Bass has been with Roebling four years, most recently serving as sales representative in the southeastern area. He will make his headquarters at Roebling's Atlanta office. Nelson, with Roebling for nine years, will locate in the firm's Chicago offices.



Typical applications for prestressed concrete made with J-L Prestressed Concrete Strand

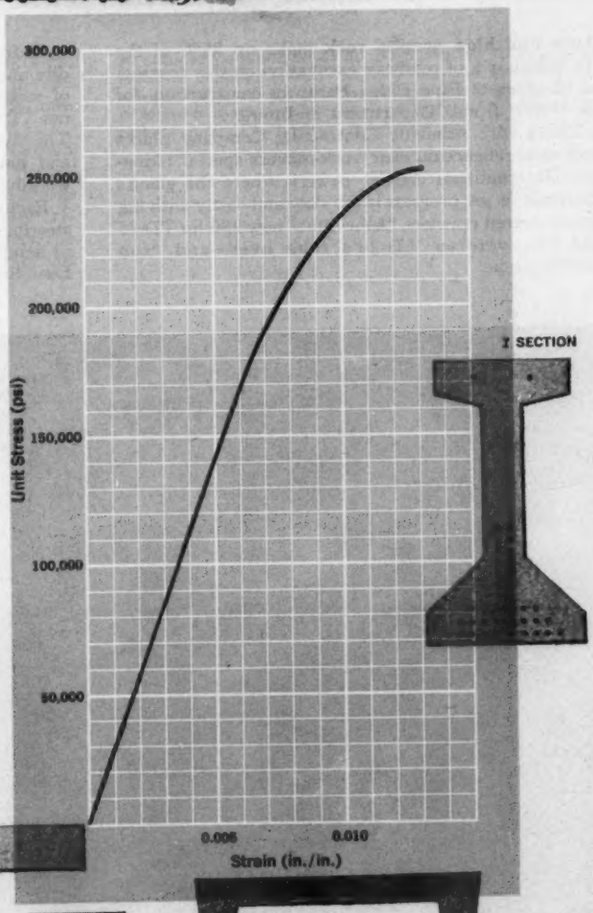
Highway Bridge Girders	Applications Under Development:
Precast Piles	
Structural Sections for Buildings	Railroad Ties
Precast Beams	Utility Poles
Precast Girders	Highway Pavement
Precast Columns	Airport Runways
Roof Deck Members for Buildings	Marine Structures

STANDARD REEL LENGTHS

Strand Diam. (In.)	Length (Ft.)
¼	25,000
5/16	15,000
3/8	10,000 and 15,000
7/16	8,000, 10,000 and 12,000
½	6,000 and 9,000

At least 90% of the order will be furnished in specified reel lengths. At the manufacturer's discretion, not more than 10% of the total length ordered will be furnished in lengths shorter than specified but in any event, not less than 2,000 feet long.

Other reel lengths and packaging available upon request.



Jones & Laughlin Steel Corporation
PITTSBURGH, PENNSYLVANIA

J&L STEEL

For more facts, use Request Card at page 18 and circle No. 263

The open-cut method is used in construction of the vehicular tunnel under the Intracoastal Waterway at Houma, La. This is the first stage of the canal section, with the single-walled approach cofferdam being excavated in the dry. Three Carver 6-inch pumps stand ready to fill the cofferdam, for at this point there is danger that water pressure will cause a "boil-up" and undermine the cofferdam.

Careful, well planned construction needed for

Tunneling in the open air

Contractors and Engineers staff article

Building a tunnel in an open cut through a busy waterway makes for a big and complicated construction job.

During the construction of the vehicular tunnel passing under the Intracoastal Waterway at Houma, La., work has been made more difficult by one season of unusually wet weather, barge collisions with the cofferdam, and huge cypress stumps in the excavation.

Problems are being solved as they arise by Baltimore Contractors, Inc., Baltimore, Md. The construction company holds the $6 million general contract for the tunnel construction. The Louisiana Department of High-

In the open-ramp section, crews weld ¼-inch steel plate with Lincoln Electric machines to waterproof the ramp. The steel plate, anchored to the concrete with I-beams, acts as the outer form on the vertical walls. Some plates have already been erected inside the sheet-pile walls. Cranes, background, are driving wood piles and sheet piles, and excavating the cofferdam.

"'Live track' power steering rock...SO WE KEEP OUR TD-2

—Asheville Contracting Compa

Shale and blue granite rock make up 85% of the 550,000-cu. yd. of roadway excavation on this contract —5.18 miles of Blue Ridge Parkway construction, for the United States Department of Interior.

That's why Asheville Contracting Company places maximum reliance on their "rock-movers' special": king-sized International crawler power! Where the going's too tough or job progress is too slow and costly with big clutch-steered crawlers, "Asheville's" new 230-hp TD-25 and two veteran TD-24's take over—and "run interference."

"International 'live track' power steering moves dirt and rock," states M. H. Reighard, Superinten of rock operations for "Asheville." "Therefore, we our TD-25 and TD-24's on trail-blazing and pioneer The 'live track' feature keeps the blade in the ma and makes steep work safer. TD-25 balance working 'almost straight up' on mountainous ter

Exclusive, years'-proved International Planet Po steering gives you full-time live power on both t to handle full loads on turns as well as straight Load-limiting "dead-track drag" is eliminated.

Seams in the steel plate covering the leveling slab are checked with an American seam tester made by the American Pipe & Steel Corp. The seam is wetted with soapy water; if there is a flaw, bubbles will be produced by the vacuum in the box.

ways is building the tunnel, which is being financed jointly by the state of Louisiana and Terrebonne Parish. Responsible for the design and supervision of construction are Singstad & Baillie, New York City, and Frombers Engineers, New Orleans.

A 2-lane tunnel under the canal was found to be more desirable than a high-level bridge over the waterway; the tunnel will allow traffic to flow freely between the east and west sections of the city of Houma.

The tunnel

The roofed-over section of the 14 × 30-foot (inside dimension) tunnel is 960 feet long. It is flanked on both sides with open ramps for a distance of about 730 feet. The ramps consist of U-shaped reinforced-concrete structures. At its deepest point, the top of the tunnel passes 19 feet below the surface of the water.

The roofed-over section of the tunnel is basically a heavy-walled, reinforced-concrete box encased in ¼-inch steel plate. The box rests on a 15-inch leveling slab that, in turn, rests on a 4-foot tremie slab. The tremie slab is anchored to the soil by timber piles.

The steel plate also covers the walls and base slab of the open-ramp sections. With its seams welded watertight, the steel skin serves as a waterproof membrane. It is protected on the outside by a 1½-inch layer of pneumatic mortar. Asphalt waterproofing cannot be used because it would be affected by the natural gases and oil present in the soil.

The cofferdam

The sheet-pile cofferdam that protects the tunnel during construction is being built in two stages. The first stage encloses approximately half the tunnel and its open-ramp approaches. The cofferdam extends about halfway into the canal, leaving the remaining half free for barge traffic. The second stage of the cofferdam, built after the first was completed, encloses the remainder of the tunnel. The two stages overlap at the middle of the waterway, permitting continuation of tunnel work.

Some 2,000 tons of Z sheeting, furnished by L. B. Foster Co., has been used in the first stage of the cofferdam. Most of the sheeting is being re-used on the second stage. The land section of the 48-foot-wide cofferdam is built of single walls braced with heavy H-beams. The portion of the cofferdam in the waterway is built with double walls spaced 23 feet apart. The double walls give extra strength to the cofferdam. They also allow for a more gradual reduction in pressure between outside and inside walls. The ground inside the double wall is partially excavated, and the water level dropped about 10 feet below the water level of the canal. The excavation inside the main cofferdam goes down as deep as 50 feet. Both the main cofferdam and the double walls are cross-braced with H-beam struts.

Barges a hazard

Before the canal section of the cofferdam could be built, the construction had to be protected from the danger of collision with barge traffic. A series of pile clusters was driven to flank the upstream and downstream sides of the cofferdam, and lighted buoys were set in place to guide traffic into the 75-foot temporary channel. In spite of the protection system, barges rammed into the cofferdam on two occasions. In the most serious case, a barge ended on top of the sheet piling and had to be lifted off with the aid of a barge-mounted revolving crane.

After the accident, the protection system was strengthened by two large barges. One was anchored about 450 feet upstream from the cofferdam, the other about an equal distance downstream. The barges were lighted at night and served to guide traffic into the slot around the cofferdam. They also acted as buffers to ward off a direct collision with the cofferdam.

Driving piles

Assisted by good equipment, the driving of the sheet piles moved along swiftly. Generally, three different types of pile hammers were used. A McKiernan-Terry 7-B-3 tacked the

...moves more
...IONEERING"
...sheville, No. Carolina

...ve track" power-steering is combined with on-the-go, ...-Lo power-shifting that lets you match power to load ...stantly, for full-speed cycles. You do away with time-...ting "gear-shift lag!"

New TD-25 seven-roller tracks are strength-matched ...the full effort of the high-torque, 230-hp turbo-...rged Diesel engine! The "25" is platformed on shock-...istant, double-box-beam track frames—smoothly car-...d on International's dual-protected Dura-Rollers, the ...ck rollers that make 1,000-hr. lube intervals practical!

As standard equipment at no extra cost, the TD-25 gives you exclusive, combined Planet Power-steering and Hi-Lo on-the-go power-shifting. And you get this work-speeding design advantage in torque-converter or direct drive model. Here, Asheville's "25" operator is ready to "shift-up" to keep the load on the move.

Power-steer and power-shift the TD-25 with king-sized loads—around curves, upgrade, anywhere! Compare planet-powered "25" ability to deliver full-load capacity, full-time—to outearn other big rigs up to 50%—blading rock, benching, push-loading, mass-production dozing (where fast reverse and decelerator action count), ripping shale! Let your International Construction Equipment Distributor demonstrate!

Even with an enormous offset load of shot-rock there's no "bank-nosing;" no sluing. The TD-25 operator simply operates the load-side track in high-speed range—the other track in low-speed range. Result: full-capacity, straight-ahead performance—the same as the "25" gives on benching, bank-cutting, or side-casting!

Heavy-duty TD-25 Dura-Rollers feature thick, deflection-proof shells; full-floating, precision fitted seals; king-sized lube reservoirs; and exclusive pressure-relief passages that protect seals from overlubrication. These minimum-maintenance track rollers give you practical 1,000-hr lubrication intervals!

International® Construction Equipment

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.
A COMPLETE POWER PACKAGE

◀ For more facts, use Request Card at page 18 and circle No. 264

In the open-ramp area approaching the closed section of the tunnel, a Marion 87-M crane handles the leads of a Vulcan No. 2 steam hammer that is driving wood piles to support the base slab. The piles being driven, right, have short steel channels bolted to their tops to give them a better grip in the concrete. They are designed to resist upward buoyant forces on the base slab. As excavation went deeper, piles were driven under water, and a 4-foot tremie seal was placed prior to dewatering.

(Continued from preceding page)

long (up to 70-foot) piles in position. Then a McKiernan-Terry 9-B-3 went down the line, driving the piles for most of their length. Finally a big Vulcan 50C moved in for the heavy finish driving. The steam-powered hammers drove the piles two at a time without the help of leads.

About 347,000 feet of timber piles is needed for the tunnel. In the areas where a tremie seal is required, the timber piles project and are anchored into the 4-foot tremie slab. The anchorage consists of two short channels bolted across the top of each pile. The piles serve the dual function of resisting the hydrostatic uplift acting on the tremie slab during construction and of supporting the completed structure.

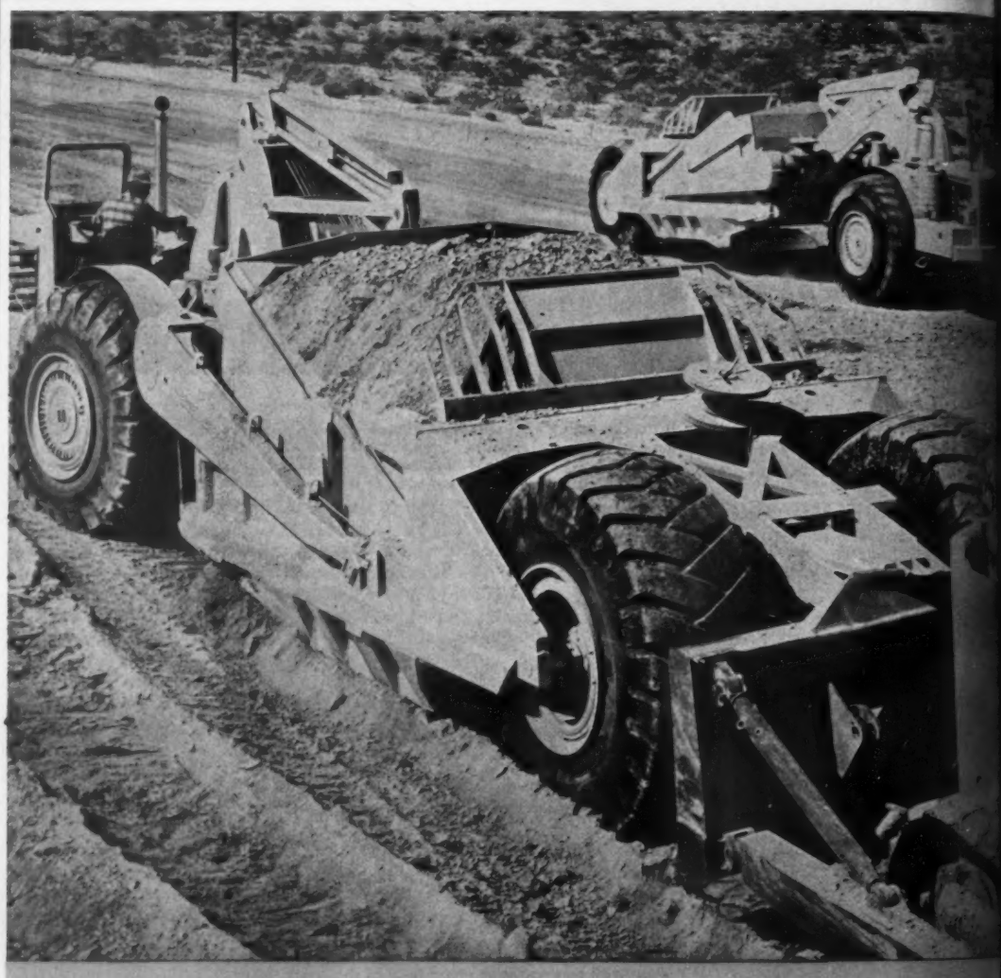
About 117,000 feet of timber piles is not fitted with anchorages. These piles are used where no tremie seal is required. Their function is solely to support the finished tunnel.

The 60-foot wood piles are driven in the dry with either a Vulcan No. 1 or No. 2 steam hammer. In the wet, they are driven with an underwater, double-acting McKiernan-Terry 10-B-3.

Excavation

Working under a subcontract, Pomco, Inc., New Orleans, handled the excavation for the first stage of the cofferdam. Most of the early excavation for the land section of the cofferdam was done in the dry. About the first 10 feet of the excavation was handled by a Bucyrus-Erie 54-B and a Koehring 605 using dragline buck-

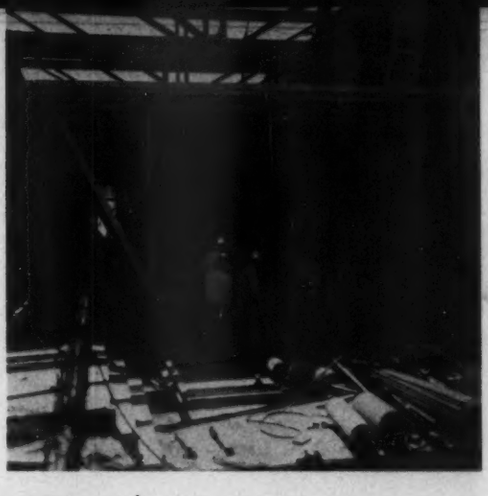
On the canal section of the first stage of the cofferdam, a McKiernan-Terry 9-B-3 steam hammer, handled by a Bucyrus-Erie steam revolving crane, drives L. B. Foster sheet piles down two at a time.



With the planet-powered 230-hp TD-25 pushing—and with 375 high-torque International Diesel hp under the "295's" hood—you heap on 34-cu. yd. with amazing new speed. Even in toughest loading conditions, "X"-member reinforcing maintains perfect Payscraper push-frame alignment!

Note that the Payscraper apron lifts to a big 94-inch opening. Two ejector-plate pushing members apply dozer-like action to turn out the whole 34-cu. yd. load cleanly. The 122-inch bowl with speeds unloading, and loading, too—adds control ease and stability loaded or empty.

Material clammed from between the struts of the cofferdam, foreground, by a Bucyrus-Erie 54-B is dropped into a Mack dump truck. The crane works on wood mats that provide adequate footing. The John Deere tractor-dozer does miscellaneous work on the job.



Forming of the tunnel is handled with two 40-foot sections of Blaw-Knox traveling forms, hinged at the top corners so that the sides can be pulled in. The plywood deck of the steel forms first receives a layer of tile. A 1-inch covering of grout goes atop the tile; the 3½-foot roof slab is placed over the grout.

ets. The buckets, avoiding the cross struts, were able to drag across the 48-foot width of the cofferdam. For the deeper work, clamshell buckets excavated between the struts.

During the excavation in the dry, three Carver 6-inch pumps stood ready to flood the cofferdam if a "boil-up" should occur. Flooding the cofferdam would balance the pressure and prevent the fluid soil from undermining the sheeting. At a depth of about 30 feet, it was no longer possible to dig in the dry, and the cofferdam was intentionally flooded. Excavation was then completed in the water.

The contractor devised an ingenious method to dispose of excavated material. Trucks carrying the wet clay dumped their loads at the end of a ramp. A high-pressure hose spread the material, preventing it from piling up at the end of the ramp. This eliminated the need for a dozer or dragline to continually spread the pile of wasted clay. About every third day, however, it was necessary for a dragline to come in and relieve the dump.

Stumps slow excavation

Although the superintendent expected to run into stumps in the excavation, he did not expect to encounter so many. Some 70 stumps had to be snagged out from between the walls of the first stage of the

Cypress stumps such as this one slowed down the sheet-pile driving and excavation operations. Each stump had to be worked out of the excavation; often, divers had to be sent down to work lines around the big stump.

◀ For more facts, use Request Card at page 18 and circle No. 265

How Payscraper power and power controls boost your dirt-on-fill delivery!

You get highest power-to-payload punch of all rubber-tired rigs in the 34-cu. yd. International 295 Payscraper. The fast-slugging, high-torque 6-cylinder International DT-817 Diesel is the Payscraper power plant.

The direct-start, 375-hp DT-817 is turbocharged to give you all-altitude, high-efficiency performance—power for cycle-speeding rim-pull—plus time-saving "no-lag" control power!

You power-shift the Payscraper, up or down—and the 4-speed planetary-type, torque-converter transmission provides load-speeding *automatic* direct-drive lock-ups in second, third, and fourth gears!

You power-steer the 150,000-lb. loaded Payscraper almost as easily as a 3,600-lb. automobile. Payscraper gives you the big control advantages of (1), exclusive International rack-and-pinion plus tandem pump steering system; and (2), 3-degree forward spindle pitch that improves scraper balance and prevents "nose-downs" in high-speed turns!

You power-control Payscraper dirt-handling actions with fingertip ease with the International PTO-driven Cable Control Unit. One cable drum of this simple planetary system actuates the apron and ejector; the other drum positions the bowl to control loading and spreading! Reach-easy Payscraper power brakes give you fast, positive stopping!

Ease into the bump-smothering Payscraper seat—press the direct-start button—power-shift the outfit into action. Compare the speed of loading, roading, and dumping the 122-inch bowl. See how the advantages of DT-817 Diesel power and complete, positive Payscraper power control can boost your dirt-on-fill delivery. Choose the 2-axle "295," or 3-axle, 34-cu. yd. "495." See your International Construction Equipment Distributor for a demonstration!

Here's your 76-page cost and production estimating book—newest, most authentic and complete guide for estimating material-moving costs—and for selecting equipment combination for top profits, *anywhere!* See your International Construction Equipment Distributor!

International® *Construction Equipment*

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE

...itive power- ...al of all operations ...afety, builds oper- ...confidence — makes ...hanol-speed minded" ... you get full ca- ... and profit from ...craper speeds up to ...mph. For example, ... effortless tandem- ... power-steering ... "the steering feel ... steering wheel"— ... positive, one-hand ...

A workman adjusts the side forms of the B-K form. Screw-type jacks are used to adjust the deck for the roof slab. The form rides on two rails on the base slab.

(*Continued from preceding page*)

cofferdam. Many of these cypress stumps were 8 feet in diameter and weighed as much as 10 tons.

The big problem was getting a grip on the submerged logs. Since the excavation was generally done through water, and it was impossible to see the stumps, divers were sent down to jet out around their bases. Even the divers had to work by "feel", for they couldn't see in the muddy water. After a cable was worked around a stump, it was pulled out by crane.

In some cases, the steel sheeting had been driven down on top of stumps. This, naturally, made the stumps difficult to extract. In one instance, pulling the stumps out from under the steel wall caused a "blow-out" that flooded a dry section of the cofferdam.

After the difficult excavation was completed, the timber piles were driven, the tremie seal was completed, and the cofferdam was pumped dry.

Steel skin acts as form

Welding the ¼-inch steel plate together and anchoring it to the four sides of the tunnel is a difficult job. Lincoln and Hobart welding machines are used to weld the steel plate to 4-inch I-beams cast in the c... On the vertical walls, the steel p... with I-beams welded to it, make ... the outside form. Seams are ... with an American vacuum-type ... ing apparatus to make sure they ... watertight.

Concrete placing

A Johnson batch plant, set ... the site, will produce the 48,000 ... yards of concrete needed for ... project. The batches are carried ... transit-mix trucks to the edge of ... cofferdam, where cranes bucket ... concrete to the forms.

Blaw-Knox traveling forms ... used for the roofed-over part of ... tunnel. Built in two 40-foot-long ... tions, the steel-framed forms ... on two rails on the base slab. De... —built by the contractor—consists of steel form panels topped with plywood.

The tile lining the top of the tunnel is on sticky paper sheets applied to the plywood forms. A 1-inch layer of grout is placed atop the tile. Wire mesh is set in the grout and extends above it to bond with the 3½-foot thick roof slab. For the sides of the tunnel, the tile is set by hand after the forms have been removed.

Personnel

E. C. Cubler is project manager for Baltimore Contractors. The resident engineer for Singstad & Baillie and Fromherz Engineers is Frank Hurka.

THE END

After 20,000 hours of trouble-free power "Old Faithful" retired by new UDT-817!

An International UD-24 engine—called "Old Faithful" by her owners—has racked up 20,000 hours of continuous trouble-free performance on a rock crushing job in Kansas. That's an average of nine hours per day for six years! At 13,000 hours a gasket had to be replaced, but there have been no major repairs. The operation, owned by Roy Baker of Valley Falls, produces 900 cu. yds. of crushed rock daily with a 32 x 40 Universal crusher.

Partners in the company, Mike and Bert Baker, say, "We decided to retire our old faithful UD-24 after it had piled up nearly 20,000 trouble-free, hard-working crushing hours. The new UDT-817 was chosen because of its greater power, direct starting and easy installation. Fuel consumption on the 817 is low, considering the power we get. And with all that power we can eliminate secondary crushing by just reducing the jaw opening."

Roy Baker says, "Of course I bought another International!" And that about sums up the attitude of contractors all over the country—they know from experience that Internationals stand up under heaviest work, are immune to dust and grit—and will pay back the investment faster than any other.

Check with your International Engine Distributor or Dealer soon, and find out how little it costs to power —or repower—your equipment with International engines. See the full line of engines and power units—16.8 to 385 max. hp.

INTERNATIONAL® ENGINES

International Harvester Co.,
180 North Michigan Ave., Chicago 1, Illinois
A COMPLETE POWER PACKAGE

For more facts, use Request Card at page 18 and circle No. 266

Ketchum is consultant for timber firm, institute

■ Verne L. Ketchum, formerly ... of the engineering department ... Timber Structures, Inc., Ramsey, ... J., is now a consultant for that ... and for the American Institute ... Timber Construction with which he has worked in developing standards and procedures for engineered timber applications.

A veteran in the field, Ketchum originated many of the techniques and procedures now used in designing structural timbers.

Engineering firm opens new office

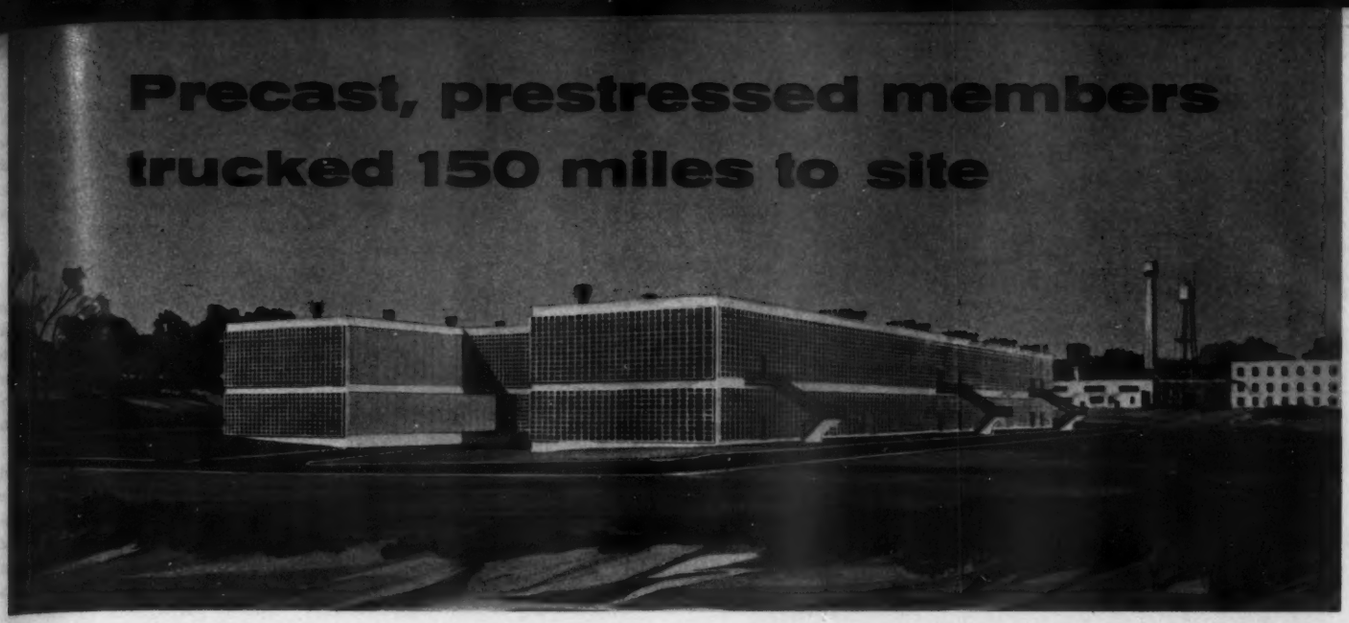
■ Engineering Service Corp., Los Angeles civil engineering firm, has opened facilities at 13912 Ponderosa St., Santa Ana, Calif., to offer complete design and field services in the Orange County area. The corporation has been active in the design of municipal improvements, airfields and military facilities.

Michigan highway map

■ The Michigan State Highway Department's 1960 Official Highway Map is now available. It contains information on state parks and hunting areas and includes a detailed map of the Detroit area.

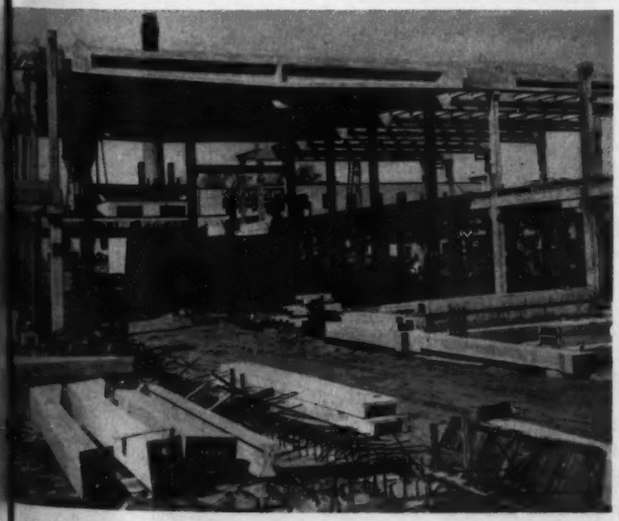
Copies may be obtained free of charge from Motorist Services Division, Michigan State Highway Department, 732-C Mason Bldg., Lansing 26, Mich.

Precast, prestressed members trucked 150 miles to site



Precast and prestressed concrete members make up a third of the 10,000 yards of concrete required for the Parke & Davis Co. chemical plant being built at Holland, Mich. The H-shaped structure incorporates some 6,186 columns, beams, channels, and exterior panels, and 135 prestressed beams. Four rows of 2-story precast columns support the roof. The first-floor columns support only the second floor; columns and floor can be removed without affecting the structure.

Crewmen with Master reversible-blade troweling machines are finishing the structural slab on the first floor. The second floor will be extended over this area. Rolls of wire mesh on the second floor will reinforce 5 inches of concrete placed atop the channels.



Since it was impossible to schedule deliveries to coincide with erection schedules, columns and channels are stockpiled near the plant. Note how the center 65-foot-long prestressed beam rests on the ends of the two side beams that have an overhang of about 6 feet.

by BILL ALLEN, field editor

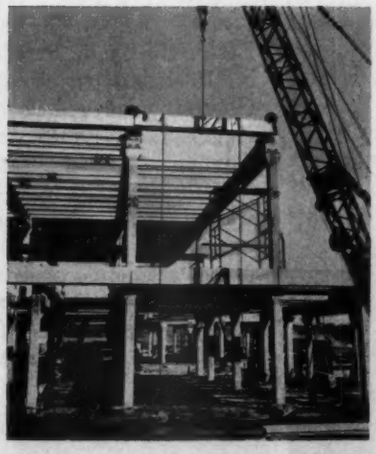
A multimillion-dollar 2-story concrete building. Fabricated in Chicago, Ill. Erected in Holland, Mich.

This is a part of the unusual construction story of the $7½ million Parke, Davis & Co. chemical plant. The precast and prestressed members of the structure are fabricated at two plants near Chicago and then trucked some 150 miles to the job site. (See "New Casting Techniques for Prestressed Roof Beams," page 40, and "Complex Precasting for Chemical Plant," page 32.)

Prestressed beams, 65 feet in length and weighing 23 tons, are trucked in individually. Precast channels, beams, columns, and exterior panels are shipped in multiple lots. The 6,186 precast members and 135 prestressed beams—representing some 300 truckloads—make up about one-third of the total of 10,000 cubic yards of concrete in the structure.

This is a unique building. Contained in its precast exterior panels are 10,000 plastic pop-out windows. In case of an explosion, these translucent windows pop out of their frames without shattering. This relieves the pressure inside the building and minimizes blast damage. Made of reinforced polyester plastic, the 14 × 20-inch windows occupy 80 per cent of the exterior walls of the building.

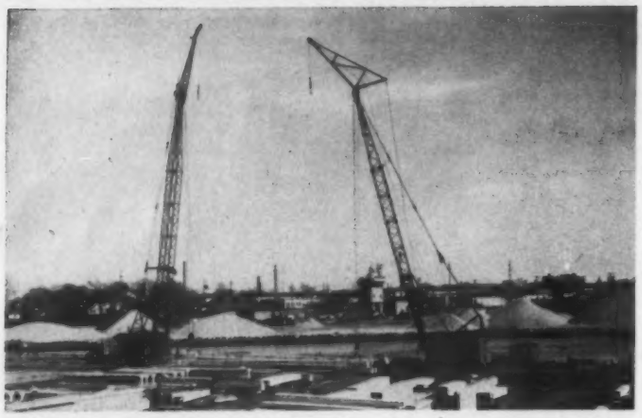
Concrete, rather than steel, was selected to frame the building because of its ability to resist the



An 18-foot precast ledger beam is set carefully in place by a 50-ton crane; these beams will be exposed to view and will have no additional finish. Exterior precast columns support roof and second floor. The intermediate columns support only the second floor.

A Lorain motor crane buckets concrete from a Smith 6-yard mixer on a Ford T-800 to the twin hopper on the tubular scaffolding. Workmen buggy concrete into place to top the precast channels of the second floor.

(Continued from preceding page)



A 50-ton crane, left, and a 45-ton rig lift a 65-foot 23-ton prestressed roof member from a pole trailer to a stockpile near the building.

corrosive effects of chemical fumes. Precast, rather than cast-in-place concrete, was chosen because of its flexibility. In the pharmaceutical industry, where new and better drugs are constantly being discovered, a chemical plant must be able to adapt its facilities to new manufacturing processes. In the Parke-Davis plant, precast concrete has been designed to permit a rearrangement of the facilities without disturbing the main structure.

Movable beams

Keyways in the sides of precast beams hold smaller beams whose positions are easily changed. These beams support grating surrounding kettles that extend through the second floor. For a major plant change most first-floor columns, second-floor beams, and concrete-channel floor can be knocked out without endangering the over-all structure. This can be done because intermediate first-floor columns support only the second floor; they do not extend to the roof. The roof is supported by four lines of 2-story precast columns.

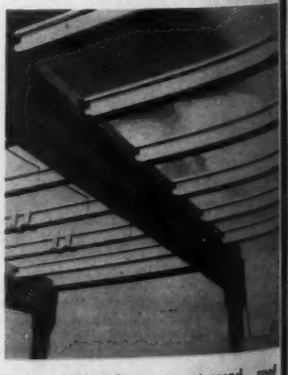
On first-floor areas subject to chemical spatterings, a ½-inch topping of epoxy concrete is put down. Highly resistant to corrosion, this type of concrete is mixed with an epoxy resin instead of a portland cement. In production areas that must be kept free from dust, a hard natural stone is embedded in the surface of the concrete floor.

Setting the headers. Slab piles have 18-strand pattern.

Movable beams have ends resting in slots in the supporting beams. Steel clips bolted to Unistrut inserts make the connections between the beams. In this area, grating will be supported on the second floor, and kettles will protrude through the openings.

The new chemical plant was designed by the consulting engineering firm of A. M. Kinney, Inc., Cincinnati, Ohio, in conjunction with the Engineering Division of Parke, Davis & Co. Darin & Armstrong, Inc., of Detroit and Flint, the general contractor, started work on the substructure in July, 1959.

The extensive mechanical work is being done by Lorne Heating & Plumbing Co., Flint, while the electrical work is handled by Harlan Electric Co., Grand Rapids and Detroit. The combined price of the separately awarded electrical and mechanical contracts totals about $1.5 million. This is nearly half a million over the price of the general contract.



The 65-foot-long prestressed roof beams support precast 18-foot purlins. Bolts pass through the ends of the purlins and attach to steel clips welded to inserts in the beams.

Galveston Seawall Piles have backbone of Bethlehem Strand

Showing storage of piles, prior to placement in seawall.

Bethlehem ⅜-in. Stress-Relieved Strand is used in an 18-strand pattern in the slab piles of the new Galveston Seawall. Cast for the U. S. Army's Corps of Engineers by the Hi-Stress Division of Anchor-Wate Company, Almeda, Texas, the piles are 30 ft long, 36 in. wide, and 8 in. deep. The initial stress induced was 14,000 lb per strand.

You can rely on Bethlehem Stress-Relieved Strand for a variety of construction applications. Uniform in its mechanical properties, it fulfills every requirement of ASTM Specification A416-57T. For full details, call the nearest Bethlehem sales office.

BETHLEHEM STEEL COMPANY
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BETHLEHEM STEEL

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Fred Hansen, super for Darin & Armstrong, points out the 2¼-inch-thick base plate on a 35-foot column. Columns had to be plumbed individually. Holes at the corners of the plate fit down on the anchor bolts that protrude from the grade beam. The space between base plate and grade beam is grouted.

Concrete channels are eased into place for the second floor by two workmen and a crane. The smaller precast units, such as these, were shipped to the site in multiple lots from the producer's plant in Chicago. The precast members account for a third of the 10,000 yards of concrete needed for the building.

The precast members for the structure are supplied by Federal Cement Tile Co., Hammond, Ind. Under a subcontract from Federal Cement, Consumers Co., Division of Vulcan Materials Co., Chicago, is furnishing the prestressed beams.

Completion of the first stage of the building is scheduled for October of this year. This will allow one of the four production units to start the manufacture of organic chemicals. The three remaining production units will go into operation at three-month intervals, with total completion scheduled for the summer of 1961.

Located on the banks of the Black River adjacent to the present Parke-Davis plant in Holland, the new plant will produce fine chemicals—those produced in pure form and in relatively small quantities—for use in the production of Parke-Davis products. The 2-story, H-shaped building contains approximately 112,000 square feet of floor area. The cross bar of the H serves as an area for utilities on the first floor and for material storage on the second floor. The vertical bars of the H serve as the areas for the four production units.

Piles support building

Work on the substructure started with the driving of 60-ton bearing piles. The 60-foot Armco spiral-welded piles were driven through soft, unstable soil to hardpan. After being driven to refusal by a Warrington-Vulcan No. 0 single-acting steam hammer, the hollow piles were filled with concrete. A total of 624 piles was required to support the building.

With the piles in the ground, work began on the closely spaced network of grade beams. The cast-in-place beams normally extend from pile cap to pile cap. The beams, with dowel steel bristling from their tops, support a structural slab at ground level. A structural slab is necessary because the mucky soil cannot support the weight of the concrete.

Beams have unusual design

Above the ground, the structure is largely built of precast and prestressed concrete. Four rows of precast columns (60–75–60 feet apart)

(*Continued on next page*)

Case® Terraload'r® digs without "bucking"... 16 Timken® bearings take the loads, buck costs

VERSATILE as a one-man band, this Case W-9 Terraload'r digs, maneuvers and dumps heaped payloads fast and easy. Its balance and stability enable it to do tough digging without "bucking". And it has up to 40,000 lbs. of crowding power for fast digging, a lift capacity of 11,000 lbs. To *roll* all the loads, give long bearing life, the Terraload'r has 16 Timken® *tapered* roller bearings at vital points: in planetary axle, pinion, differential, wheels, and rigid and steering axles.

Here's why Case and every major construction machinery manufacturer uses Timken bearings:

1) *They're tapered.* The tapered construction of Timken bearings lets them take any combination of radial and thrust loads. And they give *extra* load-carrying capacity because of full-line contact between rollers and races.

2) *They're Timken bearings.* Case and other companies know they get more for their money when they buy Timken bearings. More in service from graduate engineer-salesmen, more in research and testing facilities, more in quality. Timken bearings are made from the finest bearing-quality alloy steel available.

Timken bearings have been making construction machines better for 42 years. Make sure the machines you buy or build are equipped with Timken tapered roller bearings. They make good machines better. ***When you buy Timken bearings you get . . . 1) Quality you can take for granted. 2) Service you can't get anywhere else. 3) The best-known name in bearings. 4) Pace setter in lower bearing costs.*** The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO". *Makers of Tapered Roller Bearings, Fine Alloy Steel and Removable Rock Bits.* Canadian Division: Canadian Timken, St. Thomas, Ontario.

Industry rolls on

TIMKEN®

tapered roller bearings

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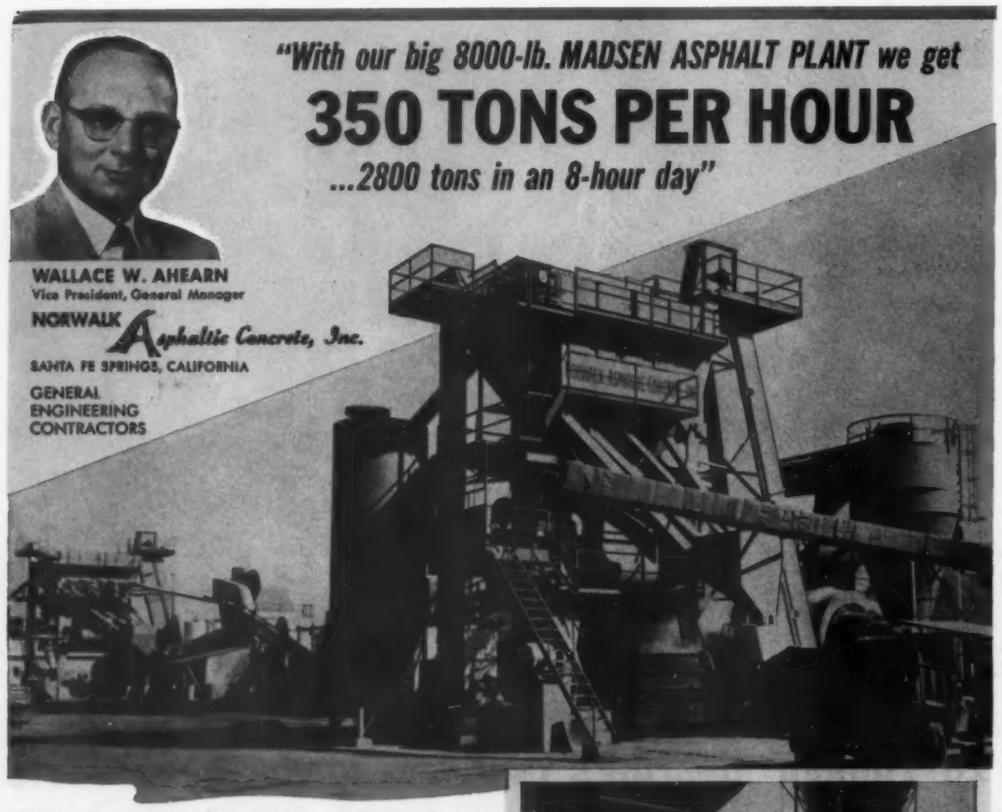
A 25-foot precast ledger beam is eased into place by a 50-ton crane. Welders make the connection by tacking a weld between the top plate of the column and a plate cast into the bottom of the beam.

Crewmen put a walkway together in preparation for placing the structural slab that had to be cast at ground level since natural ground was too mucky to support a slab. Plastic sheeting on the ground acts as a vapor barrier.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350 TONS PER HOUR
...2800 tons in an 8-hour day"
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Vice President, General Manager
NORWALK Asphaltic Concrete, Inc.
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GENERAL ENGINEERING CONTRACTORS

"We're engineering contractors and we recognize superior engineering in a piece of equipment. We own and operate two MADSEN Model 481 Asphalt Plants . . . a 4000-lb. plant and an 8000-lb. plant and we sincerely believe MADSEN Plants are the finest-engineered plants in the industry.

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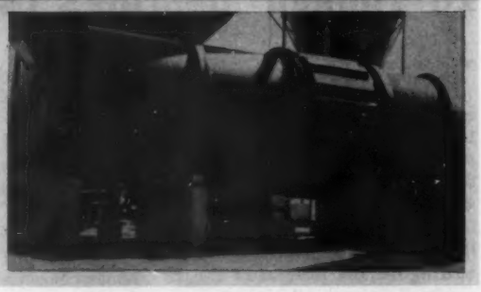
"We like the externally removable segment-liner feature of the MADSEN Pug Mill Mixer. It's a cinch to service and the mixer liners are interchangeable which means longer mixer life.

"MADSEN Asphalt Plants are CLEAN OPERATING. Actual tests show that they emit not over 10 lbs. per hour of solids to the atmosphere . . ."



Inset photo shows the 104" x 32' MADSEN Dryer used with the 8000-lb. MADSEN Plant. Dryer is equipped with forged steel floating tires. Other plant components include: a Hauck 14" burner, a 50-ton capacity hot bin, oversize hot elevator, Symons 60" x 16' double deck with split deck screen, MADSEN Model 7812 Triple Wet Tube Dust Washer, and Ray bin level indicators (showing high and low positions).

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(Continued from preceding page)

rise through two stories to support the long prestressed roof beams. The beams are of an unusual design. Instead of spanning from column to column, each of two side beams overhangs the interior column by approximately 6 feet. On the overhanging ends of the side beams rests a 65-foot-long prestressed beam that forms a part of the central span of 75 feet. The additional span is gained by the overhang of the two side beams. The central beam helps to counterbalance the weights of the two side beams, yielding economies in design.

The central, or drop-in beam, rests on a "stepped-in" ledge at the end of each side beam. Two 1-inch vertical rods rise from the ledge of each of the side beams. These fit through two 2-inch pipes cast into the end of the drop-in beam to make the connection between the two members. The space between the rod and the pipe is grouted.

Precast channels form top floor

At the second level, the floor is built of precast channels spanning 18 and 20 feet between prestressed beams. The channels are topped with 5 inches of cast-in-place, reinforced concrete to complete the floor. Certain areas of the second floor are left open. In these areas, steel grates rest

Working from Safway scaffolding, plumbers install piping to carry rain water from the roof to a storm drain system. In the background are precast purlins supporting 6-foot channels; in the foreground, a precast channel spans the 18 to 20-foot gap between the main prestressed beams.

Bill Mechem, president of W. H. Mechem Co., Flint, Mich., the firm subbing concrete erection, supervises operations at the plant.

on movable concrete beams. The open spaces make it possible for the tall kettles to rise from the first floor through the second floor.

The precast beams can be shifted around to accommodate new manufacturing processes because their ends rest in slots in the supporting beams. The beams are bolted to each other by means of steel angles and channel inserts in the concrete.

An exception to the use of precast members occurs at the second-floor level. In the warehouse area, where loads are heavier and flexibility is less important, the floor is a 10-inch, cast-in-place slab.

Two structural systems compose the roof. Over the two side spans, precast purlins span the 18 and 20 feet between the 65-foot-long prestressed beams. Held in place by epoxy resin to the tops of the purlins are 6-foot-long precast channels.

Over the central span, 18-inch-deep precast channels rest on the prestressed beams to form the roof. Topping the precast members of the entire roof is 1½ inches of fiberboard insulation covered with a built-up felt and asphalt roof.

Handle with care

The erection of the concrete members, handled by the W. H. Mechem Co., Flint, Mich., was a slow and painstaking process. Since the surface of most of the beams and columns is exposed, great care had to be taken to avoid chipping. With beams weighing up to 23 tons, crane operators had to handle their rigs as precisely as a surgeon wields his scalpel.

Since it was impossible to schedule the erection of the members to coincide with the exact time of their arrival on the job, practically all of the precast members were stockpiled on the site. Most of the erection was handled by two large cranes—a Model 85 Northwest 50-ton crane and a 45-ton Model 6 rig. Generally, each crane worked on a separate part of the building; on the 23-ton prestressed roof beams, however, they worked together.

Columns plumbed individually

Each of the 35-foot-high columns had to be set in place and plumbed individually. Unlike steel erection, it was not possible to plumb a bay at a time. Each column was set in place on top of four anchor bolts protruding from the grade beam. The base plate of the column rested on four adjusting nuts on the anchor bolts. Bolts on the upper side of the plate prevented the column from tipping.

During erection, each column was plumbed by means of two adjustable pipe braces. After the column was positioned, the space between the base plate and the grade beam was grouted. In freezing weather, when grouting was not possible, steel shims were set in under the base plate. Shims and all were later grouted.

Most of the concrete members were joined to one another by means of welding steel bearing plates. Small gaps between the members were later filled with grout. Erection was difficult in freezing weather because the weld on the cold metal was brittle. To solve the problem, the contractor heated the plates with a torch just prior to welding.

Personnel

Fred Hansen is the superintendent on the job for Darin & Armstrong, Inc. J. E. Thomas is the field engineer for Parke, Davis & Co. For A. M. Kinney, Inc., Bill Settle is the resident engineer. Bill Mechem guided the field work for his company during erection. THE END

The Federal-Aid Highway Act of 1960 has become law. It authorizes $2,089,500,000 for construction.

Computing firm opens headquarters

■ The Dacom Corp., a professional computing service for engineering, research, and industry, has been established in Buffalo, N. Y., with William H. Mestler as president. He was formerly associated with the Electro-Data Division of Burroughs Corp., and earlier was with Union Switch & Signal Co., Pittsburgh.

In the civil engineering and construction fields, Dacom is active in the analysis of curved domes using straight members. Soon the firm will be engaged in the analysis of curved domes using concrete or curved members, and the analysis of reinforced-concrete structures and concrete slabs.

Portable Lima Austin-Western 101-SE crushing plant spews pit-run stone and gravel into mobile surge bin.

Lima A-W Portable Crushers deliver

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Designed and built for high output under *rugged* operating conditions, this portable Lima Austin-Western crushing plant is *ready* to pick up and go on a moment's notice. It belongs to the Williams Brothers Asphalt Paving Company, Ionia, Mich.

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They say, "It's a reliable high-output mobile rig that's been doing a very dependable job for us in widely separated locations throughout southern Michigan.

"It's not a complicated piece of equipment. Only minimum maintenance has been required. It's easy to adjust to meet a wide range of rigid specifications in pit or quarry work. We find that the outfit's one man, central control also helps us to reduce costs per ton."

The 101-SE is a completely portable, self-contained unit designed and built for rapid transport from job to job. High-speed production of construction materials near the job greatly reduces hauling time and costs.

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Diesel power operates crushers and electric generator; all other operations are electric. Simplicity of transmission eliminates troublesome clutches, chains, sprockets and gearboxes . . . reduces maintenance, increases tonnage profits.

There's a portable or stationary Lima Austin-Western crushing and screening plant just right for your needs. Investigate—see your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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Complex precasting for chemical plant

Contractors and Engineers staff article

Some of the most complex concrete panels ever cast are being fabricated by the Federal Cement Tile Co. of Hammond, Ind.

The honeycombed panels will form the exterior walls of the Parke, Davis & Co. chemical plant in Holland, Mich. (See "Precast, Prestressed Members Trucked 150 Miles to Plant," page 27, and "New Casting Techniques for Prestressed Roof Beams," page 40.)

These are exceptional panels. Holding rows of small plastic windows, they are designed to minimize blast damage in case of an explosion. The translucent windows pop out of their frames without shattering when there is a slight increase in pressure within the building.

Since these are the first panels of their kind, the company faces some unusual forming problems. In order to strip the steel forms, it is necessary to use a 2-step block-out for each window. The upper part of the block-out is removed first; then the panel can be pulled off the bed. Since these block-outs are bolted to each other and to the forms, it is difficult to prevent leakage between the steel-to-steel surfaces.

Great care has to be taken in forming because tolerances on the 1-story-high panels are plus or minus 1/16 inch. Reinforcing steel has to be set accurately, for the bars must center in concrete that reduces in places to a width of only 1⅝ inches. Since the concrete of the panels is exposed on the building, finished surfaces have to be smooth and free of voids.

A typical panel is 18 feet high, 4 feet wide, and 10 inches thick. It contains 26 windows measuring 14 × 20 inches. Each window frame has a curved ledge or seat to fit the curved surface of the plastic. The reinforced polyester plastic, rimmed with a neoprene gasket, is pushed into place like a watch crystal.

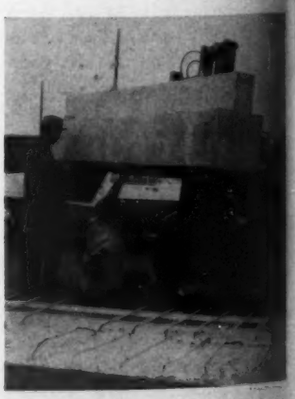
"Waffle-iron" form

The steel panel form, built by Food Machinery & Chemical Corp. of fabricated steel, resembles a large waffle iron. Essentially, it is made of three parts: the boxlike containing form; the lower block-out; and the upper block-out. The upper and lower block-outs combine to form one window. The lower block-out, about 8 inches high, is held in place to the base of the containing form by four bolts. This block-out stays in place except for major form changes. The upper block-out, about 2 inches high, is bolted to the lower block-out. In order to strip the forms, the upper block-out has to be removed after each pour. It serves to form the seat for the plastic window. Several different types of seals were applied to the steel-to-steel joints on the block-outs to prevent bleeding. (At the early stage when CONTRACTORS AND ENGINEERS visited the plant, it had not been decided which seal was most effective.)

Cages precisely assembled

In the fabricating of the panels, cages of reinforcing bars and wire mesh are carefully welded together on a jig. Because of the restricted space in the form, the cages have to be assembled within ⅛ inch.

With the forms greased and the



While a Yale fork-lift holds a flour beam, workmen remove foam plastic from the Unistrut channel cast into its base. The plastic and masking tape kept concrete out of the channel.

AUTOMATIC SAFEGUARDS KEEP JOY ROTARIES ON THE JOB

Let's face it . . . a portable compressor in the field takes a beating. The most reliable compressor you can buy is the one that is built to protect itself. That's why Joy has done everything possible to make operation and maintenance simple and automatic. Some examples: The built-in blow-down valve, the fail-safe safety circuit, the automatic drain and the thermal bypass valve.

When the compressor stops operating, the receiver blows down automatically. This eliminates the possibility that the operator will forget and try to start the machine under load.

All portables have a safety circuit, but on most of them a broken wire will make the circuit inoperative. On Joy rotaries, the compressor cannot be operated unless the safety circuit is complete and working perfectly—eliminating a possible source of major compressor damage.

Every Joy rotary has an automatic drain system designed to prevent hydraulic lock. Standard equipment also includes a thermal bypass valve which prevents dry starts and eliminates moisture condensation.

Even common items like the oil filter have been given special attention. Instead of a filter that requires cleaning periodically, Joy rotaries have replaceable element filters—just put in a new element whenever you change oil.

The load control is as simple as possible. You just turn the knob on a calibrated dial to set the pressure you want.

Foolproof features like these are standard factory equipment on all Joy rotary portable compressors—a complete line from 125 to 900 cfm.

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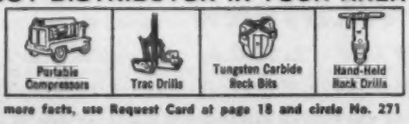

JOY

Joy Manufacturing Company
Oliver Building, Pittsburgh 22, Pa.

In Canada: Joy Manufacturing Company (Canada) Limited, Galt, Ontario

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Cages for the 26-window panels are assembled. Some steel fits into a 1⅜-inch thickness of concrete. A Lincoln 180-amp welder is used.

An upper block-out is set onto a lower one in a window form. One bolt and two lugs hold them together.

Two Louden 3-ton overhead electric cranes lower a panel form onto a bed that is vibrated by an eccentric weight on a variable-speed electric motor. Finishing and steam curing follow on another bed.

Ben Crossno, in charge of quality control, shows how the block-outs are joined. The upper block-out is on the left. A panel is in the background.

Some of the complicated work of forming 1-story-high concrete panels for the new Parke-Davis chemical plant is illustrated above.

block-outs in place, the cage is lowered into the form. The form is then lifted by overhead cranes and placed on a giant vibrating bed. Concrete from the central-mix plant is placed in the forms by a special bucket carried by a Yale 3-ton fork-lift. By adjusting the speed of a 7½-hp electric motor on the bed, the vibration of the form can be varied in order to give the best consolidation of the concrete.

The form is next moved to a finishing and curing bed. Several hours after concrete has been placed, the upper block-outs are removed. Four hours after placement, steam curing starts. It continues for 12 hours at a temperature no greater than 150 degrees.

Because of the large number of block-outs, stripping is difficult. Two external vibrators help to shake the form loose from the concrete. End forms are removed and side forms released. Then an overhead crane pulls the panel from the bed.

Beams, columns, channels

Some 498 perforated panels will be produced for the Parke-Davis plant. These are in addition to 104 solid 1-story panels that form certain sections of the exterior walls.

Although the perforated panels are

(*Continued on next page*)

Aside from the perforated panels, Federal Cement Tile is turning out over 6,000 precast items for the Parke-Davis plant, including columns, beams, roof and floor channels, and purlins. Here, reinforcing for a structural beam is welded on a special jig with a Lincoln welder.

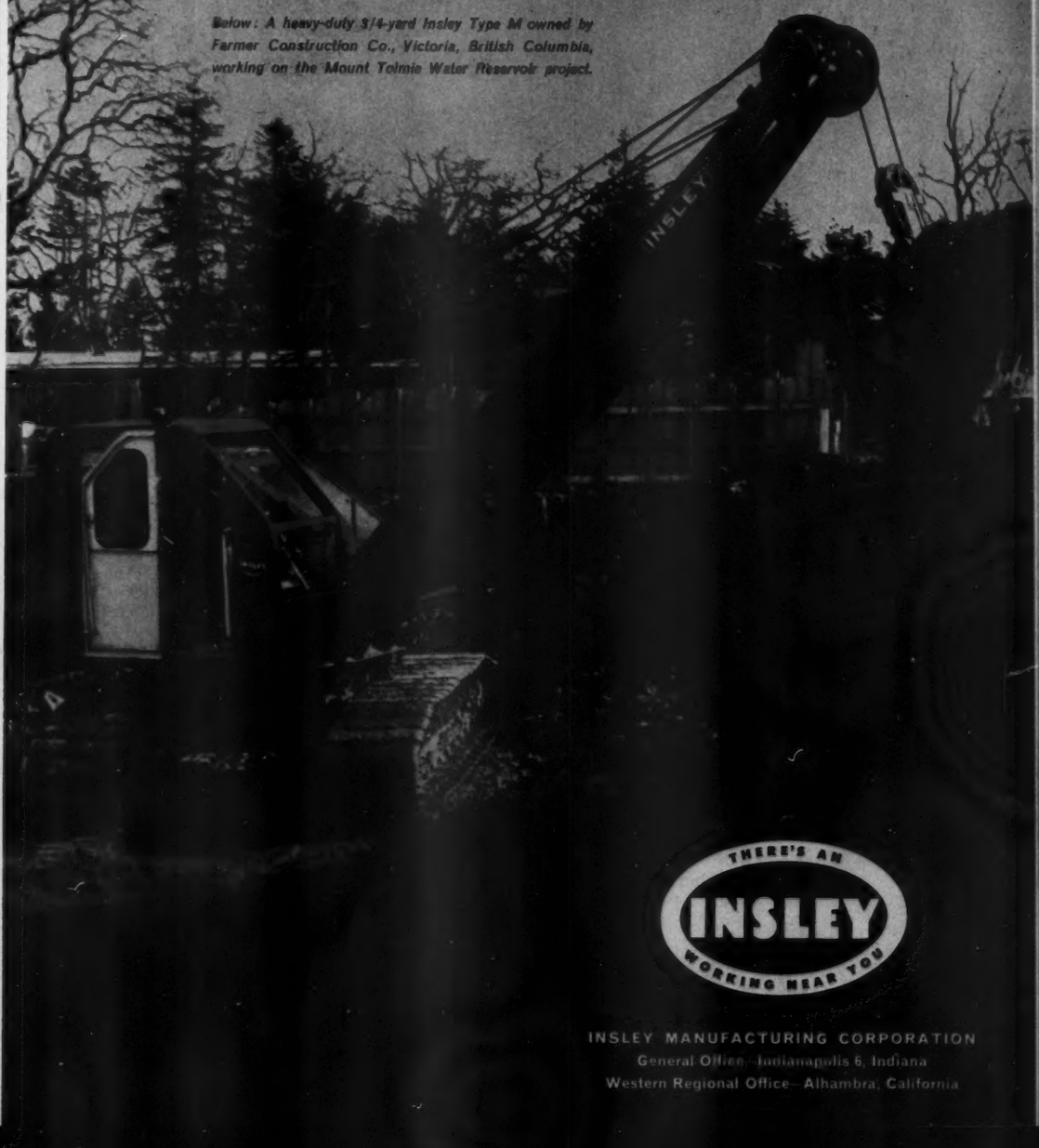
For more facts, use Request Card at page 18 and circle No. 272 ▶

There's an Insley working near you

Little wonder so many Insleys are in your area! An Insley makes good operators even better—more productive, more profitable. One reason for this is that the Insley is designed to give the operator every advantage. The cab's a good example. Wide open vision takes the guesswork out of crowding, swinging and dumping . . . makes for greater safety too. Dependability is another reason you'll find so many Insleys in your neighborhood. An Insley is built to pile up performance records, day after day, under seemingly impossible conditions.

There's an Insley working near you—any one of a complete line up to 45 tons in crane capacity, up to 1½ cu. yds. in bucket capacity, with crawler, self-propelled or truck mountings. There's an Insley distributor working near you too . . . with complete service facilities and 24-hour parts availability. See him today. Get all the facts on the Insley line.

Below: A heavy-duty 3/4-yard Insley Type M owned by Farmer Construction Co., Victoria, British Columbia, working on the Mount Tolmie Water Reservoir project.



THERE'S AN INSLEY WORKING NEAR YOU

INSLEY MANUFACTURING CORPORATION
General Office—Indianapolis 6, Indiana
Western Regional Office—Alhambra, California

A 35-foot column is ready for concrete in Form-Crete steel forms. All forming was supplied by Food Machinery & Chemical Corp. The anchor plate at the base is plug-welded to four reinforcing bars.

Forming of a beam is complicated by numerous rows of Unistrut channels that are clamped in place and welded to reinforcing steel. The Unistrut grips nuts that act as bolt-on points for securing other concrete members.

Inserts are welded to the reinforcing cages in this double beam form. Two short movable beams are formed on this bed; note the break in the reinforcing steel between the two beams.

"Call FOSTER get pipe for piling...PLUS"

Order your pipe piles from Foster and you'll not only get the right type of pipe, in the exact diameter and wall thicknesses your job requires, but you'll get a big "plus." All deliveries are "fast" . . . on time. And where Foster's high-strength thin wall pile is your choice, you get your pipe piles cut to the exact lengths you need—so you'll have no wasteful cut-offs, and a fraction of the normal number of splices.

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For the new Piling Catalog CE-9 write or call **L. B. FOSTER CO.**
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PIPE · VALVES AND FITTINGS · PILING · RAIL · TRACK MATERIAL

For more facts, use Request Card at page 18 and circle No. 273

(Continued from preceding page)

the trickiest to produce, they represent but a small percentage of the total number of precast members necessary for the job. Federal Concrete Tile Co. has about 6,200 separate pieces to turn out for the 3-story structure. These range in size from 35-foot columns to 4-inch roof channels. In addition, there are beams of many shapes and sizes, floor channels and lightweight roof purlins. All of the members were cast under roof at the Hammond plant.

Forming

The precasting operation follows this general sequence:

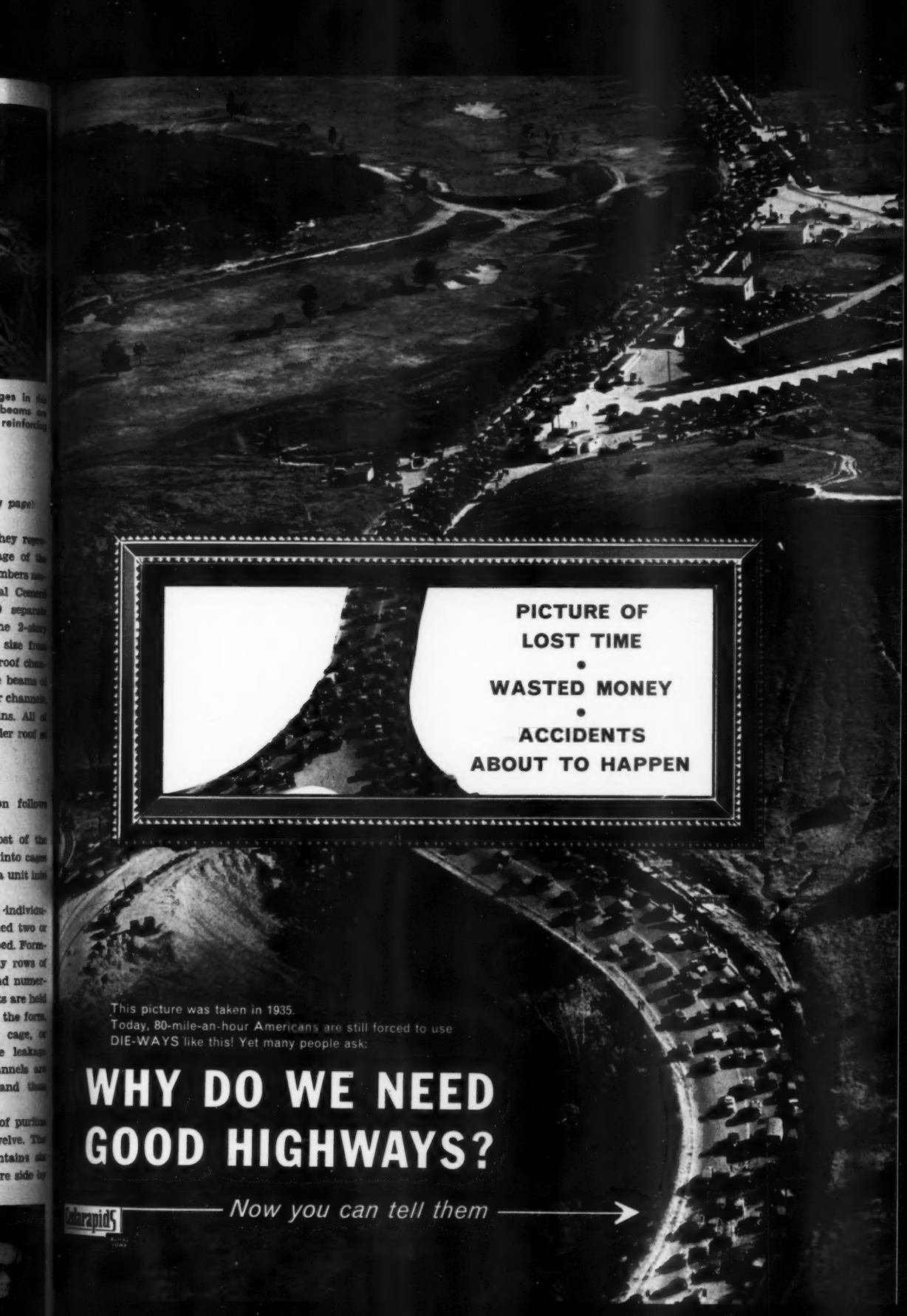
Reinforcing steel for most of the precast members is welded into cages on jigs and then placed as a unit into the steel forms.

Some beams are formed individually, while others are formed two or three at a time in a single bed. Forming is complicated by many rows of Unistrut, bearing plates, and numerous other inserts. The inserts are held in place by being bolted to the form, welded to the reinforcing cage, or both. To prevent concrete leakage into the Unistrut, the channels are filled with foam plastic and then sealed with masking tape.

The 14-inch I-shaped roof purlins are cast in packages of twelve. The Form-Crete steel form contains six rows of purlins. The rows are side by

A Roustabout crane made by Hughes-Keenan Corp., Delaware, Ohio, lifts a beam from a form.

For more facts on Insert, use Request Card at page 18 and circle No. 274



This picture was taken in 1935.
Today, 80-mile-an-hour Americans are still forced to use DIE-WAYS like this! Yet many people ask:

WHY DO WE NEED GOOD HIGHWAYS?

Now you can tell them →

Cedarapids

43 REASONS WHY AMERICA NEEDS BETTER HIGHWAYS NOW!

Strangulation of our national economy by a gigantic nationwide traffic jam, and the crippling of our defense effort through failure to keep the Federal Highway Program going, would be more costly than any of us can afford.

But most American citizens *don't know why* we need good roads. They are apathetic. Because they do not understand, there is little public support for a well-planned, nationwide system of interstate, state and rural roads.

It is up to us to give the public the facts . . . show our friends, neighbors, and associates the benefits the Highway Program will bring to each individual . . . how it affects his pocketbook, even his life. Only when every citizen knows the facts can public opinion influence *intelligently* the men who make the laws to keep the Highway Program rolling.

Here are 43 of the hundreds of reasons why we must have better highways now. Add your own reasons and use them all to help obtain the enthusiastic local support we need.

GOOD ROADS SAVE MONEY

1. Total annual avoidable waste over *all* roads in the U.S. amounts to $3 billion. Interstate Highways would save $550,000,000 in gas consumption, brake and tire wear, vehicle operation—save $725,000,000 now wasted on traffic accidents —save $825,000,000 in time lost by commercial vehicles.

2. Modern Interstate Highway engineering eliminates steep grades, sharp curves, intersections at grade, stop and go driving. Good highways can bring about annual savings of $750,000,000 in direct operating costs of trucks and buses.

3. Payments of insurance covering property damage and personal injuries resulting from highway accidents equal 12½¢ per gallon of gas consumed, That equals $116 for every motor vehicle registered.

4. It costs less right now to build a typical mile of Federal Aid Highway than it did during the first three months that the 1956 Highway Act was in effect.

GOOD ROADS SAVE LIVES

5. In 1920, the traffic death rate per 100 million miles was 28.2. In 1940, the death rate was 11.4. Then we started building better, safer roads. Bertram D. Tallamy, federal highway administrator, predicts that the death rate will decline from the 5.6 per 100 million miles in 1958 to 5.0 in 1970 and to 4.4 in 1975.

6. The controlled access highway is at least 2½ times safer than the ordinary highway. On Virginia's Shirley Highway, with controlled access, the fatality rate is 0.8 deaths per 100 million miles. On the parallel U.S. 1, with no control of access, the death rate is 10.6.

7. Traffic accidents today are killing 38,000 people annually. Experts estimate that highways *engineered for safety* would save 4000 lives per year. By 1970, continued use of The Interstate System could save 37,800 people.

8. If traffic volume increases by 50% in the next ten years, there will be 55,000 fatalities a year—unless safer roads cut the rate.

9. In Chicago, the chance of having an auto accident on congested streets is 30 to 50 times greater than on the new Congress Street Expressway.

10. In 1959, accidents cost $4.3 billion. Modern highways *can* eliminate a very large part of the monetary waste of accidents.

GOOD ROADS FOSTER ECONOMIC GROWTH

11. Modern highways are a sound, durable investment in the growth of the Nation.

12. The dollar value of goods and services for a specific period is called the Gross National Product. $1 billion of highway construction contributes to the Gross National Product as follows: Steel, 510,000 tons; bituminous materials, 995,000 tons; cement 16,000,000 barrels; explosives, 18,345,000 lbs.; aggregates, 76,415,000 tons; petroleum products, 122,794,000 gallons; construction equipment, 34,584 pieces; trucks and cars, 22,500 pieces. These are based on each $1 billion in excess of an annual rate of $5.8 billion of construction.

13. The New York Thru-Way is officially credited with stimulating 650 million dollars worth of industrial, commercial and residential development, including $50 million around Tarrytown alone.

14. With the New Jersey Garden

State Parkway, the gain in taxables and retail business in the counties it serves is *twice* that of New Jersey's remaining 11 counties.

15. On Route 128 near Boston, some 227 companies have built 17 industrial parks and 175 million dollars worth of buildings to house upwards of 28,000 people—workers with good wages to spend.

GOOD ROADS ARE ESSENTIAL FOR NATIONAL DEFENSE

16. In case of war, *all* sections of the country must be swiftly available for the defense effort.

17. Highways are relatively invulnerable to atomic attack. It would take 20,000 Hiroshima-type bombs to destroy the 40,000 miles of the projected Insterstate System.

18. We need good highways to evacuate people from our cities; bring in food; bring in medical supplies and help; move large volumes of military vehicles and weapons.

19. Highways are extensions of production lines; defense production depends on them. During World War II, 8 out of every 10 parts needed to make a tank in Cleveland came by truck from 23 states. 75% of the workers in 749 defense plants drove to work in their automobiles. 60% of all out-bound tonnages from defense plants was road-borne.

20. A network of good highways will assure nation-wide mobility for all our defense resources.

GOOD ROADS BENEFIT LABOR

21. The American working man drives his own car to his job. He can offer his services throughout a greater area; he has a greater diversification of jobs to choose from.

22. With good highways, the laboring man can think in terms of minutes rather than miles of driving to and from his job.

GOOD ROADS BENEFIT FARMERS

23. American farmers operate over 6,406,000 motor vehicles (including 3 million trucks). 89% of all farm products now reach their markets by highways.

24. Better rural roads bring markets and sources of farm supplies closer together, make schools more accessible to farm homes, make medical services readily accessible.

GOOD ROADS INCREASE BUSINESS

25. One out of every six businesses (mostly small, independent firms) serve the Transportation Industry. Good roads are a shot in the arm to the small businessman.

26. Of the people who do the buying, 60% own automobiles. American consumers spend $38 billion per year to own and operate their cars, helping to support garages, service stations, manufacturers of automotive parts and accessories, etc.

27. 60% of American buyers purchase goods that are transported via highways, streets and alleys. Fast deliveries increase business.

28. 70 million Americans take vacations by car each year (over 75% of tourist travel is by car), averaging 1013 miles per round trip. Many others travel by bus. Altogether they spend $9.2 billion on vacations. This is big business for motels, resorts, restaurants, and souvenir shops, to name a few!

29. The annual bill for recreation travel is $14 billion. 22% of this is automobile expense. Big business for the automotive industry!

GOOD ROADS FURTHER FULL EMPLOYMENT

30. One out of every seven American jobs is in the field of Highway Transportation.

31. Truckers provide over 5,750,000 jobs. Highway Transportation Industries provide 9.7 million jobs. Employed is a labor force equal to the population of all New England states, Arizona, Colorado, Idaho, Montana, New Mexico, Wyoming.

32. Each $1 billion spent on highway construction equals 102 million man-hours of employment on the site of construction and 126 million man-hours off the site—a total of 228 million man-hours of labor.

33. In 1958, an extra $400 million in highway contracts, let as an anti-recession measure, provided 137 million man-hours of employment and broke the back of the recession.

GOOD ROADS BENEFIT ALL INDUSTRY

34. For the Trucking and Motor Carrier Industry alone, Interstate type highways provide these advantages: —Reduction in number of power units required; use of lighter tractors; increased tire life; reduction in fuel and maintenance costs; reduction of accidents and insurance premiums; year-'round maintenance of on-time schedules for livestock and perishable goods.

35. The Private Consulting Engineer profession carries 40% of the engineering load of the new Interstate System.

36. Utilities are free from the burden of acquiring easements of private land because so many consumers are located on good highways. In Oregon, a utility study shows savings of about $100 a mile on 3212 miles of public right-of-way, mostly passed on to consumers.

37. Practically every industry is stimulated by increasing motor vehicle registrations. In 1959, registrations totaled 70,416,000 (3.1% more than in 1958). *In 1971*, it is estimated that 101,200,000 motor vehicles will travel over a trillion miles annually (20.7% on the Interstate System). *In 1976*—114 million motor vehicles will travel 1.2 trillion miles a year.

38. By 1976, 230 million people will need industrial goods and services fostered by increased travel on highways, rural roads and city streets.

GOOD ROADS BENEFIT EVERY CITIZEN

39. 8 million children ride buses to school every day of the school year. They need *safe* all-weather roads.

40. Movement of goods and people is faster on modern highways.

41. Time saved means lower transportation costs and lower prices for truck-borne merchandise.

42. Annoying, dangerous traffic congestion is reduced.

43. Modern highways, engineered to last by the application of results of the AASHO test road research at Ottawa, are the cheapest investment a private citizen can make to insure his life, his security, his country's growth, and his children's future.

Cedarapids
Built by IOWA

There is *one* big reason why YOU should get behind this program for enlightening the public on the benefits of a continuing Federal Highway Program. Highway construction is vital to your way of life and the growth of your community. Here you have the ammunition to inform and mold public opinion into supporting, and demanding, vital highway legislation. *Use it!*

BUILD BETTER HIGHWAYS NOW! *Save Lives—Save Time—Save Money*

Sponsored as a public service by **IOWA MANUFACTURING COMPANY** *Cedar Rapids, Iowa, U.S.A.*

A GLIMPSE OF THE FUTURE
demanded by Mr. and Mrs. America

Through-city expressways provide fast transport of goods and services; save time, money and lives of city workers; foster economic growth.

Well-planned interchanges like this relieve traffic congestion to assure safe, easy access to transcontinental highways from urban areas, speeding produce from factory to consumer.

Straight, safe, controlled access Interstate Routes should cover the Nation for greater mobility in Peace or War. Goods and people, weapons and troops must move swiftly to every section of the country to strengthen our economy and defense efforts.

America today is a nation on wheels. Broad, safe highways open new recreational areas and expand tourist trade. Good, all-weather roads across mountainous terrain speed transcontinental commercial travel.

Cedarapids Built by IOWA

BETTER ROADS MEAN BETTER LIVING

INS 18

Sponsored as a public service by YOUR CEDARAPIDS DEALER
in cooperation with Iowa Manufacturing Company, Cedar Rapids, Iowa

PRINTED IN U.S.A.

side, with form plates separating the individual members.

Concrete placing

Concrete is placed in the forms from a hydraulically tilted bucket on a fork-lift. As it is placed, the mix is consolidated with internal vibrators. After the surface is finished, the precast members are given a 12-hour steam cure followed by a 3-hour cooling period. The forms are then stripped, and the member is moved by a Roustabout crane to a cleaning and finishing area.

Hauling the precast members to Holland, Mich., keeps five flat-bed trucks on the move. The trucks carried 25-ton loads for the 150-mile, one-way trip. Hauling costs represent about 5 per cent of the cost of fabricating the members.

Personnel

For Federal Cement Tile Co., W. F. "Bill" Clark is vice president of operations. R. C. Grant is plant manager, and J. C. "Joe" Pugliese is project engineer. THE END

Bituminous-concrete group selects research site

■ Texas A & M, at College Station, Texas, has been chosen as the location of the National Bituminous Concrete Association's new $1.3 million Quality Improvement Program. The program will cover every phase of high-type bituminous-concrete construction that might influence the quality of the finished pavement.

NBCA is composed primarily of bituminous-concrete paving contractors here and abroad.

New text published on thermal stresses

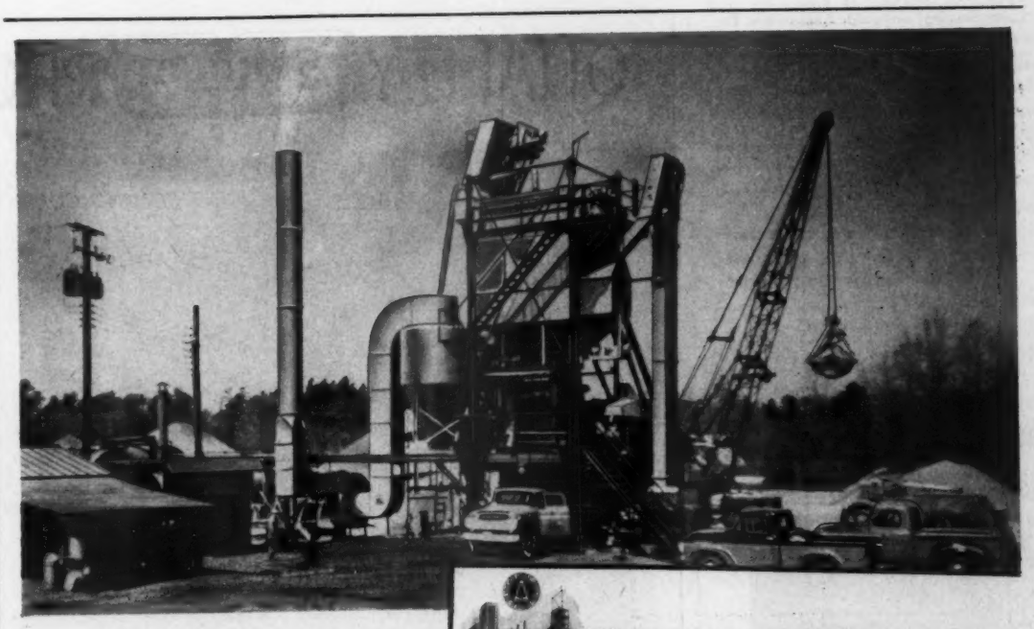
■ All current theoretical techniques for determining stresses produced by a solid object that is subjected to specified heating conditions are surveyed in "Theory of Thermal Stresses." Methods of practical thermal-stress analysis are also covered.

The book is divided into four parts: basic theory, heat conduction, thermal stress analysis for elastic systems, and thermal stress analysis for inelastic systems.

Covered in the first part of the book are mechanical and thermodynamical foundations; alternate formulations of thermoelastic problems; two-dimensional thermoelastic formulations; and uncoupled quasi-static thermoelastic theory. Part two deals with formulation of heat-transfer problems; basic problems in heat conduction; and methods of solving heat-conduction problems. Part three covers thermoelasticity; thermal stresses in beams, rings, trusses, frame, built-up structures, and plates; and thermoelastic stability. Inelastic thermal stress problems, viscoelastic stress analysis, and plastic stress analysis discussions complete the volume.

Copies, priced at $15.50 each, can be ordered from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

THESE STEEL-LINED, PRESTRESSED-CONCRETE TANKS, shown at various stages of completion, will go underground to store aviation fuel for the Air Force at Ozol, Calif. Twelve in all, they are leakproof and designed to withstand atomic explosions. Prestressing wire, supplied by The Preload Co., New York City, was wound under tension of 150,000 psi around each tank to resist outward forces exerted by the contents and exterior loadings. The tanks, now in operation, have a storage capacity of 83,500 barrels each.



This
Simplicity S-75
looks and runs
like new
. . . after 14 years
and 580,000 tons

Write us for locations of Simplicity plants convenient to you. See these plants in operation, talk to the men who run them. The information they give is more valuable to you than our "sales talk" or literature. Over the years our satisfied customers have been our best salesmen.

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May 18, 1960

Mr. Percy E. Todd
The Simplicity System Company
Riverside Drive
Chattanooga 6, Tennessee

Dear Mr. Todd:

Reference is made to your letter of May 16, 1960, in regard to the total tonnage that our Model S-75 Plant has produced.

We actually did not operate the plant during the 1946 season; we first put it into operation at Grandy, Virginia, during the summer of 1947. Since that time, and up to the time the photograph you have was taken, we have produced 580,000 tons at five locations in Virginia and North Carolina. It has been at its present location --Oyster Point, Newport News, Virginia--since September 1953.

We hope that this information will be of some value to you.

Yours sincerely,

VIRGINIA ENGINEERING CO., INC.

Richard F. Krause, Vice President

A DEPENDABLE NAME IN CONSTRUCTION . NATIONALLY . SINCE 1915

THE SIMPLICITY SYSTEM COMPANY

DEPENDABLE

For more facts, use Request Card at page 18 and circle No. 275

PRESTRESSING

New casting technique

Contractors and Engineers staff article

There's more difference than meets the eye between turning out prestressed bridge girders and fabricating prestressed roof beams. Although the basic work methods are similar, prestressing beams for buildings demands far more care and technical know-how.

Consumers Co., Division of Vulcan Materials Co., Chicago, found this to be the case when it began producing structural beams for the Parke, Davis & Co. chemical plant in Holland, Mich. (See "Precast, Prestressed Members Trucked 150 Miles to Plant," page 27, and "Complex Precast for Chemical Plant," page 32 of this issue.)

Forming of the beams is complicated because of their odd shapes. For example, the 65-foot drop-in roof beam has a double-tapered bottom,

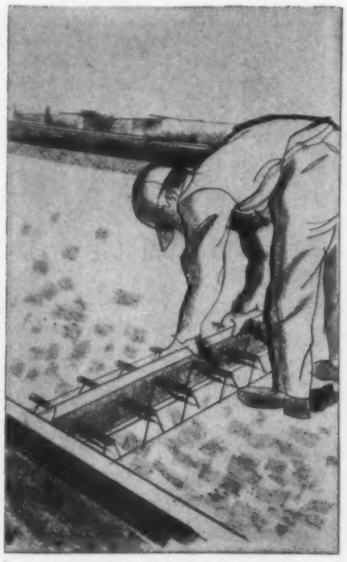
Odd-shaped beams required a trial-and-error method of precasting and prestressing units at Consumers Co., McCook, Ill., for use in the Parke, Davis & Co. chemical plant in Holland, Mich. The Hyster Karry Krane is stringing strands; as hold-up, hold-down, or bulkhead points are encountered, the rig drops the strands and workmen thread them through holes. At right, I-beam bridges, straddling the bed, carry Superior hold-up devices.

(Additional photo on front cover)

A workman threads strand through holes in the plywood bulkhead forms of the 65-foot cantilever beams. The odd-shaped double-bulkhead form is banded together and to the base plate for additional strength and rigidity.

Welded reinforcing cages for a 65-foot drop-in beam are wired into place. In all, 8 cages are required per beam. The lower group of strands parallels the double taper of the specially built base-plate forms. All strands are being draped.

QUALITY SEALTIGHT® PRODUCTS FOR C



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• "PREMOULDED MEMBRANE" Vapor Seal assures complete isolation of the structure from the site . . . waterproofs — vaporproofs. Ideal for all types of construction. Water Vapor transmission rating of only .0066 gr. per hr. per sq. ft. Strong . . . permanent . . . may be installed as a complete monolith. Write for Catalog No. 1660.

• "CORKTITE" Impermeable Perimeter Insulation will effectively prevent heat loss for the life of the structure. Not affected by moisture, K value is constant. Used wherever good design requires a proper insulation below-grade to permanently retard heat loss. Write for Catalog No. 1660.

• EXPANSION JOINTS in a type and size to meet your exact specifications. Sealtight line includes: Asphalt, Fibre, Gray Sponge Rubber, Corkfill, Plain Cork and Self-expanding Cork Control (Expansion) Joints. Ideal for highways, pavements, runways, bridges, buildings, ramps, etc. Write for Catalog No. 100.

• JOINT SEALING COMPOUNDS that provide a positive joint sealer for years of economical, trouble-free joints in concrete construction. Available in four types: Hot and Cold Pour Rubber-Asphalt Joint Seal, and Hot and Cold Pour Jet Fuel Resisting Rubber-Asphalt Joint Seal. Write for Catalog No. 100.

• DUO-PVC WATERSTOPS that are extruded simultaneously from two top-quality PVC compounds. Designed with an exclusive new U-bulb center section that permits this waterstop to safely accommodate elongation *correctly* . . . without stretching the material or stressing the multiple-rib area. Write for Catalog No. 100.

• "HYDROMAT" ASPHALT LINERS that are ideal for lining all domestic, industrial, municipal and recreational facilities where the containment of water, wastes, sludges, brines, etc., demand an efficient, economical and impervious lining material. Write for "HYDROMAT" Manual.

• BUTYL CAULK, a top-quality, elastameric, single component joint sealing or caulking material that is applied directly from container. Available in trowel or gun grade. Will adhere to any reasonably clean surface. Write for Catalog No. 100.

• WRITE FOR CATALOG No. 100 for additional information on any of the following products: • Premoulded Tongue and Groove Joints • Plane of Weakness Dummy Joints • Concrete Curing Compounds of all types • Sewer Joint Compounds • CM-60 Polysulfide Base Joint Sealing Compound • • Air Entraining Agents • PVC Base Plates • Asphalt Plank • • Bridge Pads • Mastic Lath • Corrugated Closure Stripe • Plus many, many others.

National distribution assures prompt service and delivery

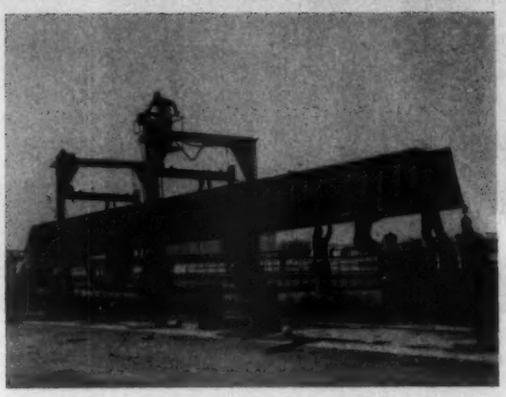
...or prestressed roof beams

stepped-in ends, and continuous ledges at the top.

Complicated stranding pattern

The unusual design of the beams complicates the stranding pattern. In the 65-foot cantilever beams, the strands of the 6-foot overhang section must be held toward the top of the beam to resist the negative moment. This makes necessary the use of one hold-up device and two hold-down devices within the length of the beam. To make the pattern more complicated, two of the 28 strands enter at the top of the beam at one end and leave at the bottom at the other end.

Numerous inserts make forming slow. Welding plates and continuous steel channels (Unistrut) must be bolted to the steel forms before concrete can be placed. One beam contains as many as 50 welding plates. Another requires six continuous rows of Unistrut. (These steel channels hold nuts to which precast members may be bolted.) In some cases, the inserts are at odd positions on the beam and must be drilled into the concrete after the beams have been lifted from their beds.



A Watco double form, handled by a 25-ton Travelift, goes into place over a bed for a drop-in beam. The 65-foot beams were the longest precast for the plant. There are 135 beams cast for the job, ranging from 21 to 65 feet in length.

Great care must be taken to get a smooth finish on the prestressed members. There is no hung ceiling in the plant to conceal the beams. They have to look good.

In January of this year, Consumers started turning out the beams at its McCook, Ill., yard. By the middle of April, just when all the wrinkles were getting smoothed out of the operation, the last beam was lifted off the bed. It was a fair-sized job involving a total of 135 beams. The work was done under a subcontract from Federal Cement Tile Co., Hammond, Ind., which did all the precasting for the Parke-Davis plant.

The five different types of beams vary in length from 21 feet to 65 feet. The longest of these support the roof of the 2-story building in a unique cantilever arrangement. Three beams, each 65 feet in length, make the three spans of 60-75-60 feet between the columns. The center span of 75 feet is made by the 65-foot drop-in beam resting on the overhanging ends of the two side beams.

The shorter beams make simple spans between columns at the second-

A new tool from Switzerland—a Von Arx air gun—makes fast work of cleaning welding plates on this 65-foot cantilever beam. Blunt-ended needles are vibrated against the surface of the plate to clean off deposits.

FOR CONCRETE CONSTRUCTION . . .

WATERSTOPS

ASPHALT LINERS

CAULKING COMPOUNDS

OF PRODUCTS USED IN CONCRETE CONSTRUCTION

FOR COMPLETE INFORMATION . . .

• CATALOG No. 100 . . . graphically describes and illustrates the Sealtight line of products used in the construction of Highways, Pavements, Bridges, Airports and Concrete Structures of all types.
• CATALOG No. 1660 . . . discusses need for a true vapor seal and provides proof-positive as to how "Premoulded Membrane" fulfills this need. Illustrates and describes the product, its applications and installation facts.
• HYDROMAT MANUAL . . . a technical manual describing the many applications for Hydromat Asphalt Linings. Covers cost-saving advantages of this product, discusses the many and varied applications and contains installation data.

The SEALTIGHT line includes a *complete* line of modern, job-tested products used in the construction of highways, bridges, airports, dams, ramps, etc., plus an allied line of specialty products used in the construction of industrial, institutional, commercial and residential buildings. SEALTIGHT products are developed specifically to meet the need of modern engineering practices and manufactured to strict quality control standards to meet the rugged demands of the construction industry. Specify and use SEALTIGHT products secure in the knowledge that these products not only meet but exceed specifications and will effectively perform their designated function. SEALTIGHT products are available nationally through a vast network of Sales-Engineers, Manufacturer Representatives, Distributors and Dealers . . . each is ready and willing to serve you.

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☐ HYDROMAT MANUAL

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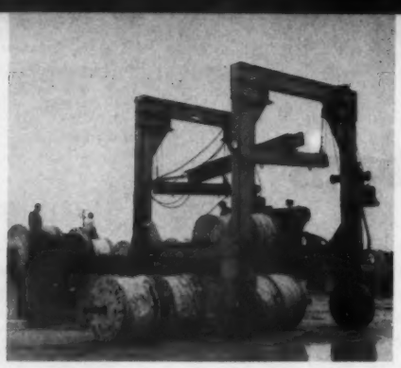
For more facts, use coupon or Request Card at page 18 and circle No. 276

Two Travelifts are used to lift a 22-ton cantilever beam from a bed. All the precast, prestressed units had to be trucked 150 miles to the building site.



The versatile Travelift is also used to load reels of American Steel & Wire ½-inch strand onto a reel rack at the end of a bed.

Concrete is eased into the forms from the 2¼-yard bucket of a Michigan 175A. The mix is vibrated by four external and four internal vibrators.

(Continued from preceding page)

floor level. Their construction is complicated by numerous inserts and channels. Their sides contain slots that support the ends of movable beams. Strands are not draped in these beams.

Time-saving techniques

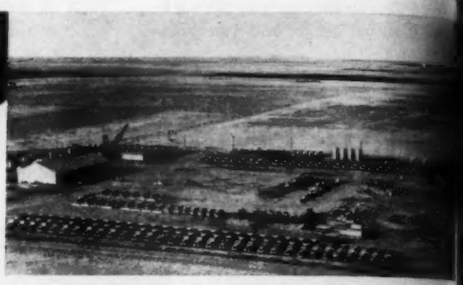
As was to be expected, the 135th beam came off the line a lot faster than the first. Through experience, the supervisors found out how they could save time and how they could improve quality. Here are some examples:

Ledges on the beams were formed by steel block-outs bolted to the forms. To these block-outs were bolted plates that eventually anchored into the concrete. The men found it important to loosen the bolts that tie the block-outs to the main forms before steam curing. This permitted the main form to expand with temperature without transmitting the motion to the plates. Had the bolts not been loosened, the expanding forms would have pulled on the plates, causing cracking around the edges of the plates.

Bolting channels

A time-saving method was found to bolt the Unistrut channels to the forms. First the bolts were inserted in the predrilled holes in the forms. Then the nuts were put loosely on the ends of the bolts. In the next step, 10-foot lengths of channel were threaded over the nuts. Finally, the bolts were tightened up from the outside of the form. This method was much faster

Superior hold-down devices at the center of a drop-in beam extend through the pilot liner, or base plate, to a movable rod in a steel beam that is embedded in the concrete. A screw-type connection joins the devices to the hold-down rod.



Multi-million dollar picture. Here is part of Western's equipment lined up for inspection at Oahe Dam. Photo shows 8 trucks, 23 bulldozers and crawler pieces and 9 scrapers.

2 ways Standard Oil helps Western Contracting Corporation save on Oahe Dam job

In eight years on project, 10 million gallons of diesel fuel and gasoline have been delivered on time and when needed

Saving No. 1 F. L. "Red" Napple, Standard Oil staff engineer, and Standard Oil agent Bob Friman have been serving Western on the Oahe Dam project since the first dirt was moved in 1952. This means continuity of service that can be invaluable to a contractor. Red Napple has an engineering degree plus more than 13 years' experience in just this kind of work. Western thus has the equivalent of another engineer helping them. Napple is located at Aberdeen and Friman at Pierre, both only a few miles from the job. Western works around the clock. So does Standard. Bob Friman and his men make deliveries 24 hours a day, winter and summer. Western never has equipment down while waiting for deliveries of fuels, lubricants or greases.

Saving No. 2 Western uses only quality products—Standard's Diesel Fuel, STANDARD RED CROWN

than trying to insert a bolt through a hole in the form to meet a nut contained in the Unistrut.

To keep concrete out of the channels, a gasket material had to be used. The best, by trial, was ⅜ × ⅛-inch adhesive-backed felt; some 13,000 feet of it was used. Two narrow strips—one under each edge of the channel—made a satisfactory seal.

Holes in forms reduce bubbles

Horizontal ledges in the sides of the forms proved to be a collection point for air bubbles. Drilling ⅛-inch holes at about 6-inch centers in the forms over points where the bubbles accumulated helped to get rid of the air. The method didn't eliminate the trouble entirely, but it did result in a smoother concrete surface.

A new tool was found to save time in cleaning the concrete from the welding plates. An air-powered gun vibrates a bunch of blunt-ended needles against the surface of the plate, knocking off deposits in a hurry. The Von Arx air gun is made in Switzerland and distributed in this country.

Stranding

Stranding was one of the first steps in the fabrication of the beams. For the 65-foot beams, the strands were pulled down the bed individually by a Hyster Karry Krane. At beam ends, hold-down points, and hold-up points, the strand was threaded by hand through the holes. On the shorter beams, where strands were not draped, the miniature crane carried a template containing 10 strands down the length of the bed.

Hold-up devices were hung from solid I-beam bridges spanning each bed at the appropriate points. Superior hold-down devices penetrated holes in the steel pilot liner (base plate) to be secured to a beam cast into the concrete bed.

In tensioning, a Hannifin 15-ton jack was used to pull the strands individually. The ½-inch strands were pulled to 25,200 pounds. The 7/16-inch strands were pulled to 19,000 pounds. To compensate for frictional drag through draping devices, it was necessary to tension draped strands first from one end of the casting bed and finally from the other end.

Reinforcing steel for the beams was first welded into cages, then carried and placed by one of the Karry Kranes. Steelwork was complicated by the unusual shapes of the girders. On the drop-in beam, eight separate cages were required to complete the reinforcing. The individual cages were wired to each other and to the strands.

Forming

Some $16,000 worth of Watco steel forms was bought for the job. Since the beams were going into a highly specialized building, it is doubtful that the forms will ever be used again.

Forms for both sides of the 65-foot beams were handled as a unit by a Travelift straddle-type carrier. The double taper of the drop-in beam was formed by a tapered steel base plate resting on the cross beams cast into the bed. The shorter beams were cast in a line using about 120 feet of forms with wood block-outs at the ends of the beams.

Placement of the stiff concrete was handled by a Michigan 175A front-end loader. Carrying the concrete in its 2¼-yard bucket, the speedy rig shuttled back and forth between the central-mix plant and the forms. As the 8-sack mix was placed, it was vibrated extensively by four external and four internal vibrators.

Curing

After a 4-hour preset period, the steam was turned on the beams to bring them up to a temperature of from 135 to 140 degrees. The forms were draped with neoprene-coated nylon tarps. By the following day, the beams had generally reached sufficient

(Continued on page 45)

A Hyster Karry Krane assists workmen as they bolt block-outs to the main forms. Welding plates, frequently spaced, are bolted to the two faces of the boxed-out sections. Bolts joining these sections to the main forms are loosened before steam curing starts so that the forms can expand without cracking welding plates at the edges.

◀ For more facts, use Request Card at page 18 and circle No. 277

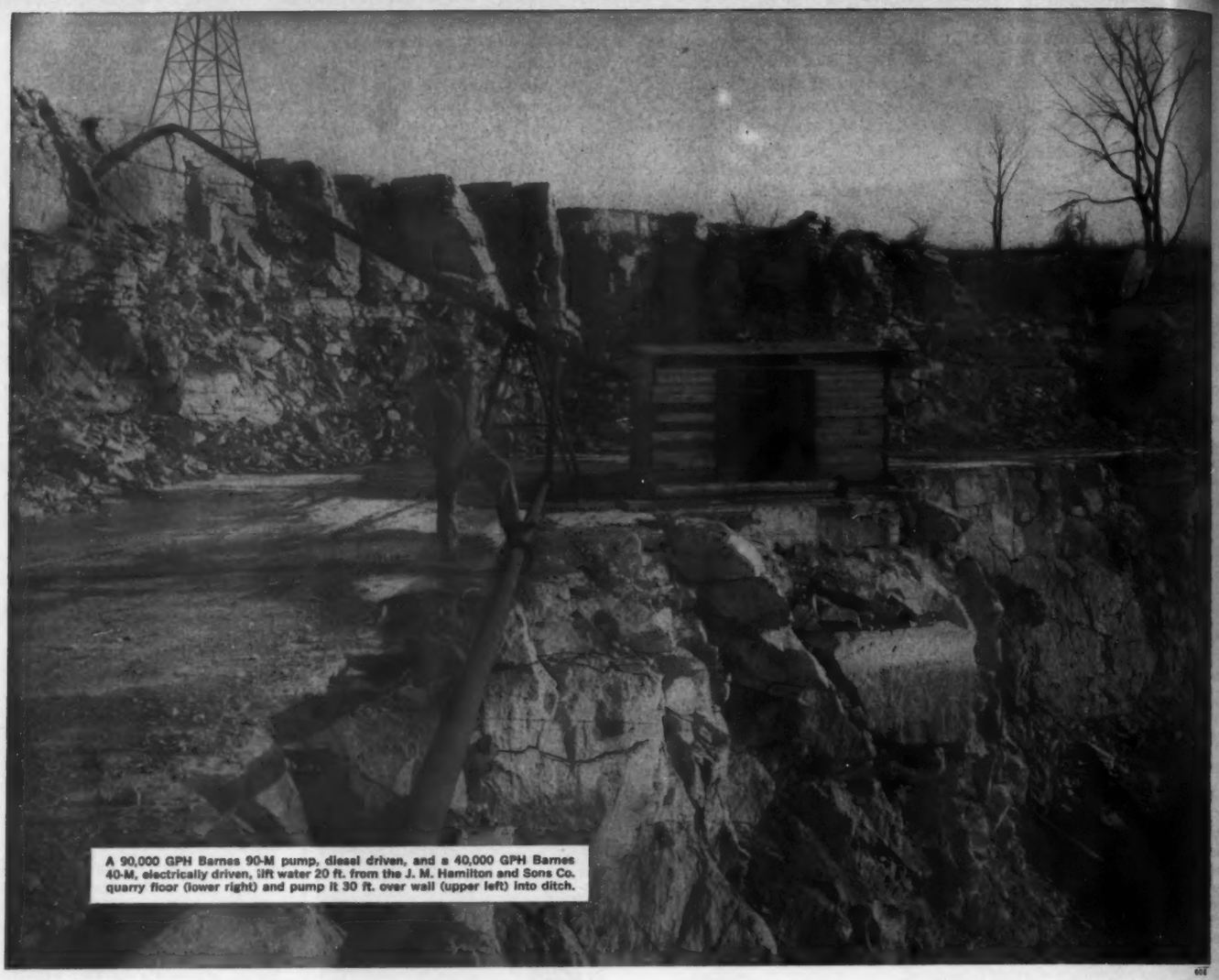
Gasoline, STANOLUBE Motor Oils, AMOCO Lithium Multi-Purpose Grease. With these quality products, equipment is never out of service because of a motor oil or grease failure. Quality products give top level performance over a wider range of conditions. Fewer products do more jobs. This means less inventory, less chance for misapplication, less paper work, less servicing of equipment is needed. Less equipment for handling fuels, lubricants and greases is used, and less lubrication training is required.

A contractor who gets the kind of service Western is receiving on the Oahe Dam job knows he is making savings on the job. You can get such service. Call the Standard Oil office near your job wherever it is in the 15 Midwest or Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Illinois.**

STANDARD

You expect more from STANDARD and you get it!

Eight years on the job for each of these men—Bob Friman, Red Napple of Standard and Western's general superintendent, A. "Blackie" Blackwell. More than 10 million cubic yards of earth and shale have been moved under Blackwell's supervision. Red Napple, Standard's staff engineer, has been working with contractors such as Western for 13 years. He has an engineering degree from the University of Missouri and has completed Standard's Sales Engineering School.



A 90,000 GPH Barnes 90-M pump, diesel driven, and a 40,000 GPH Barnes 40-M, electrically driven, lift water 20 ft. from the J. M. Hamilton and Sons Co. quarry floor (lower right) and pump it 30 ft. over wall (upper left) into ditch.

"Bottomless Pit" no match for Barnes Self-Primers...

Since 1956, two Barnes Self-Priming Centrifugal Pumps have kept J. M. Hamilton and Sons Co. stone quarry near Marion, Ohio, workable the year-round. A rising water table had created "bottomless pit" running springs that, with surface water, flooded the 15-acre quarry floor to a depth of eight ft. An electrically driven Barnes 40-M, operating continuously, and a diesel driven Barnes 90-M operating in wet weather, dewatered the pit and have kept it dry for over three years without service problems.

You, too, can depend on Barnes Pumps for fast, dependable dewatering at lowest cost. *Consider their advantages:*

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FAST SELF-PRIMING — No wasteful recirculation while pumping.
LONG LIFE — Rugged cast body, extra thick wall sections.

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(Continued from page 43)

strength to be detensioned and removed from the bed.

In detensioning, the strands were burned according to a prescribed pattern. Each group of strands was cut symmetrically on about a vertical line straight down the middle of the end of the girder. Cutting the strands in this way eliminated a tendency to bend the beam sideways.

Hold-down and hold-up points were released at an intermediate time during the detensioning to prevent undue strain on the beam.

Hauling

Even after the beams were cleaned and stockpiled, they still had a long way to go. They had to be trucked about 150 miles to the building in Holland, Mich. Transportation costs ran about 16 per cent of the total price of the job. It cost, for example, $326 to ship one 23-ton drop-in beam.

The large beams were shipped individually by pole trailer. The smaller beams were transported several at a time on a flat-bed truck. During the spring of the year, the trucks had to meet the reduced axle loading caused by Michigan's "frost laws." In some cases, the pole trailers had to be equipped with triple axles.

Personnel

The prestress plant and all other facilities of Consumers Co. Division, Vulcan Materials Co., are under the supervision of Clay Lambert, vice president in charge of operations. Ray Byrd was assistant superintendent in charge of production. THE END

Lin tee conference

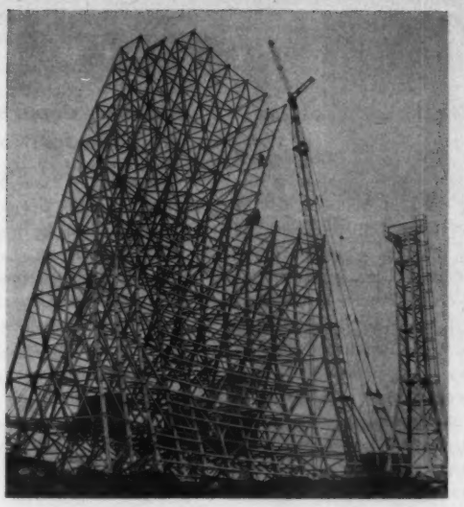
■ Lin tee franchisees will confer on September 26 at the Statler Hilton Hotel in New York City. Production, promotion, and advances of the Lin tee-beam will be covered. T. Y. Lin & Associates, Van Nuys, Calif., is franchising firms to make the tee.

Special HRB report on highway research

■ A special report on "Highway Research in the United States," covering needs, expenditures, and applications, has been published by the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

The report recommends an expanded highway research program over the next four or five years at an estimated cost of $34 million. Costs of such research range from $50,000 for studies of standards for secondary and rural roads to $10 million for improved knowledge of aggregates and soils. Traffic safety, road maintenance, and electronic devices for simulating traffic flow and controlling vehicles on the road were also given high priority for investigation.

A review of current research activity and of new areas where research is needed are outlined in the book. Special Report 55 costs $2.80 and may be ordered from the Highway Research Board.



THIS HUGE 120-FOOT-DIAMETER tropospheric scatter parabolic communication antenna, which will be used to extend the range of the nation's radar defense system, is being erected by Blaw-Knox Co., Pittsburgh, for the U. S. Air Force, under a subcontract from Western Electric Co. The prototype shown here is being constructed at Harmarville, Pa., to check fabrication techniques, make electronic pattern tests, and test the heating system that will prevent ice from forming on the reflector surface.

12 Floors...90 Days

Symons Steel-Ply Forms in 20'x8' Gang Sections

... Re-Used 20 Times on 580 Unit Housing Project

McCarthy Brothers Construction Company, St. Louis, used Symons Steel-Ply Forms to gang form the Anthony W. Webbe Apartments, a public housing project in St. Louis.

Gang forming seemed obvious for this job, but quality of pour was most important. This was to be shear walls from the ground through the 12th floor. McCarthy worked with the Vernon L. Goedecke Company, St. Louis, and the Symons engineering department. Symons engineers recommended a ganged section 20' long x 8' high.

It took 25 days to pour the foundations on the 40 x 600 foot structure and approximately 90 pouring days to bring the building through the 12th floor . . . a total of 196,000 square feet of forming in the walls. 15,000 square feet of Symons Steel-Ply Forms were re-used approximately 20 times.

Complete *housing project story* available on request. Symons Steel-Ply Forms can be rented with purchase option.

NEW Bolt for Gang Forming

Permits the ganging of any size Symons Form with regular hardware. Now you can secure all the forms required, together in sections, move the sections in place, insert the ties and the unit is ready for a pour.

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Marion Long-Life Hopper Trailers

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Names in the News

Harold A. Cartier, senior vice president, and A. Kingsley Ferguson, vice president in charge of sales, for Walter Kidde Constructors.

Walter Kidde appoints two vice presidents

The engineering and building firm of Walter Kidde Constructors, Inc., New York, N. Y., has named Harold A. Cartier senior vice president. He is now responsible for the company's purchasing and estimating operations and will continue to be active in new-business development. Cartier has been with Kidde for 34 years in various capacities.

A. Kingsley Ferguson is now vice president in charge of sales and will be responsible for the company's new-business program.

Changes in ASCE staff; Reynolds in new post

A reassignment of staff responsibilities has been made at the headquarters office of the American Society of Civil Engineers, New York, N. Y.

Don P. Reynolds, who has served as an assistant to the secretary, was made assistant secretary, replacing

Don P. Reynolds, new assistant secretary of ASCE.

E. L. Chandler, who has retired. Reynolds will continue to administer ASCE's technical activities. A veteran with ASCE, Reynolds joined the staff in 1942 and has served as editor of the society's magazine, *Civil Engineering*.

E. Stuart Kirkpatrick, formerly an assistant to the secretary, was appointed executive assistant, a new post in the ASCE staff structure.

Donald D. King will continue as assistant to the secretary in charge of coordinating the professional activities of the society.

Otis D. Gouty and John Fisk will continue as assistants to the secretary, Gouty in charge of local sections, Fisk in charge of student chapter activities.

Engineers, Inc., names Bowser project engineer

Engineers, Inc., engineering and designing firm of Newark, N. J., has appointed Hamilton V. Bowser project engineer of the firm. Bowser had previously been chief structural engineer with the company.

Army Engineers' changes

Brig. Gen. Robert J. Fleming has been made division engineer of the U. S. Army Corps of Engineers' Southwestern Division, Dallas, succeeding Brig. Gen. William Whipple, who is retiring from active service. Col. Stanley G. Reiff, deputy division engineer, will be acting division engineer until Gen. Fleming reports in November.

Col. Harold C. Brown has assumed the post of district engineer of the Galveston District, succeeding Col. E. A. Hansen, who has retired. Col. Brown was formerly technical operations officer, U. S. Army Element, Atomic Energy Commission, Washington, D. C.

Highway department promotes four

Four men have been promoted within the North Carolina highway department to fill vacancies left by recent retirements.

Layton Gunter replaces B. W. Davis as state maintenance engineer. Formerly, Gunter was assistant maintenance engineer. Joe J. Powell, who has worked in the bridge department supervising construction for the past 15 years, has been made state bridge maintenance engineer, the post left empty by the retirement of C. B. Taylor.

Thomas L. Amerson has been assigned to the finance department to replace H. K. Witherspoon, while Donald E. Corwin takes the post of cartographer, which was vacated by L. Polk Denmark.

Humphrey appointed PCA district engineer

The Portland Cement Association has named Homer A. Humphrey district engineer of its southern New England district, with headquarters in Boston. He succeeds Malcolm S. Loring, who has resigned.

Humphrey will be responsible for the association's engineering and educational efforts in Massachusetts, Connecticut, and Rhode Island.

He joined the association as a soils

engineer, then became regional soil-cement engineer in the midwest regional office, senior research soils engineer of the highways bureau, manager of the personnel training program, senior highway consultant, and regional paving engineer in the midwest region.

Maj. Gen. Lane heads river commission

Maj. Gen. Thomas A. Lane is now serving as president of the Mississippi River Commission, Vicksburg, Miss. He was appointed to this position by President Eisenhower to succeed Maj. Gen. W. A. Carter, who became governor of the Panama Canal Zone.

Maj. Gen. Lane will also serve concurrently as division engineer of the U. S. Army Engineer Division, Lower Mississippi Valley, with operational districts at St. Louis, Memphis, Vicksburg, and New Orleans.

Calcium-chloride group elects new president

William E. Dickinson, executive vice president and chief engineer, has been elected president of the Calcium Chloride Institute, Washington, D. C.

He replaces George H. Kimber, president since 1946, who remains as chairman of the board.

Dickinson served the institute as field engineer, chief engineer, and vice president before becoming executive vice president. He retained his duties as chief engineer in the last two posts.

Left to right, Hugh F. Doherty, vice president and director of purchasing of Perini Corp., Framingham, Mass.; Louis R. Perini, Jr., vice president for the company's western operations; and Louis O. Kelso, secretary of the firm.

Executive appointments made by Perini Corp.

Perini Corp., Framingham, Mass., has made Hugh F. Doherty of Framingham vice president and director of purchasing; Louis R. Perini, Jr., of San Rafael, Calif., vice president for western operations; and Louis O. Kelso of San Francisco secretary of the corporation.

Doherty, with Perini since 1932, has served in many administrative capacities. In 1942, he was appointed secretary. He is a member of The Moles and various civic and fraternal organizations.

Lou Perini, Jr., the senior executive for all Perini activities in the Pacific area, began working for the corporation during summer vacations at the age of 12. In 1948, he formed with Charles F. Paltrineri a construction partnership, which operated until 1957. He returned to Perini Corp.'s building division in 1958, and from 1959 until the present he was assistant to the president.

Kelso is a corporate lawyer and senior partner in the firm of Kelso, Schnacke, Lerer, Cotton & Holmes of San Francisco. He is the author of a number of magazine articles on economics.

Vermilya-Brown appoints assistant to president

Samuel Weston, who joined Vermilya-Brown Co. two and a half years ago as project manager, has been appointed assistant to the president of the New York City building firm.

Weston, a civil engineer, has been in building construction since 1934, specializing in apartment-house and

Samuel Weston, new assistant to the president of Vermilya - Brown Co., New York.

office-building construction. In his new post, he will devote himself principally to housing projects of all types.

San Francisco chamber honors J. H. Pomeroy

The Award of Progress of the San Francisco Chamber of Commerce has been presented to J. H. Pomeroy & Co., Inc., engineering and construction firm of that city.

Robert N. Pomeroy, president of the company, accepted the award on behalf of the Pomeroy organization. During the presentation, the firm was cited for having enhanced the city's business and commercial redevelopment area by converting a 30-year-old building into an ultramodern world headquarters—the Pomeroy Building that is located at 755 Sansome St.

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New line up of Chrysler M & I engines . . . with a new running mate: Perkins liquid cooled diesels. Both highly compatible, highly competitive power plants now available in the United States and Canada from a single source: Chrysler M & I. Parts and service for both—marine or industrial, gasoline or diesel—available within 8 hours from Chrysler's nationwide Engine Center network.

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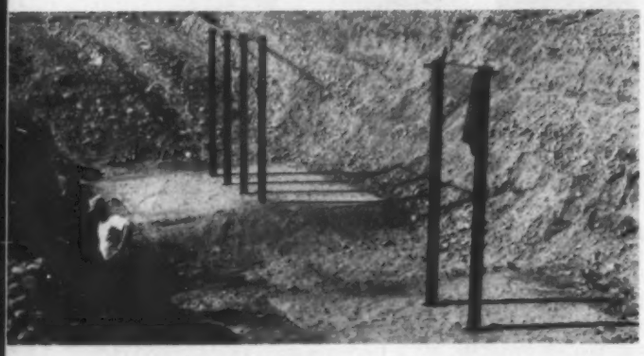
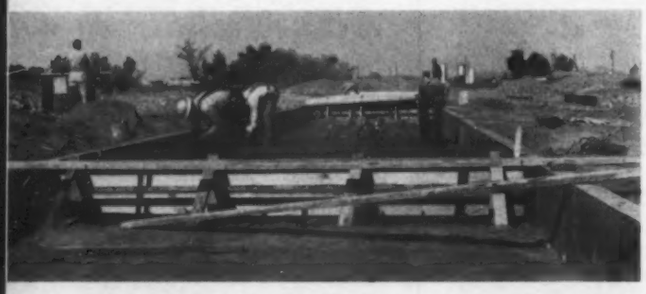
For more facts, use coupon or Request Card at page 18 and circle No. 281

A unique anchoring design made possible a considerable saving in concrete and reinforcing for two new casting beds for the prestressing plant of the Superior Sand & Gravel Division of Fisher Contracting Co., Phoenix. Here's how the beds were constructed:



The 24-inch-thick anchor slabs constructed in this excavation have 5-inch pipes welded to channels encased in the slabs. Some 13 feet of backfill will be compacted over the slabs.

Men compact backfill over the anchor slabs. The one at left uses a Wacker vibrating compactor; the other, a Jay compactor. The backfill helps resist pull of prestressing cables on piers during tensioning.



Side forms are set for a new bed. One, a flat universal bed, 240 feet long and 12 feet wide, can handle two lines of girders. The second, 240 feet long and 8 feet wide, is for long-span single-tee sections.

Crews remove the nuts holding Superior 1¼-inch hold-down inserts during the casting of the slab. Next, the concrete is finished, leaving the inserts open and ready for use.

In this area, a workman is making inserts for the new single-tee bed that will produce components for long-span roofs. Note this structure's roof, which is made of prestressed double-tee sections.

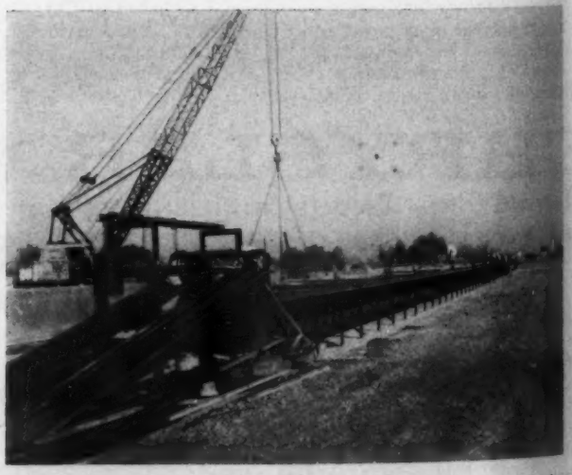
PRESTRESSING

Prestressing plant has unusual new casting beds with

Underground slabs to help anchor piers

by RALPH MONSON, field editor

The new universal bed is put to work. A Koehring 605 handles the placing of a ganged section of Food Machinery forms into place. At center, girders cure under tarps. At far right is the new single-tee bed.



Crews ready the new single-tee form for transit-mix concrete. Note the inclined anchor member that ties the top of the stressing pier back to the anchors, which transmit the load to the underground slab.

An unusual design using heavy anchor slabs buried under 13 feet of earth provided substantial savings in both concrete and reinforcing steel in the construction of two new casting beds at the prestressing plant of the Superior Sand & Gravel Division of Fisher Contracting Co., Phoenix, Ariz. The unique foundations use the compacted earth backfill to help resist the pull of the prestressing cables on the piers during the pretensioning operation.

The two new beds—which will substantially increase the plant capacity of this pioneer Arizona producer of prestressed-concrete products—will also produce some new items, including a large single-tee section.

New items

The new flat universal bed is 12 feet wide and 240 feet long. It will handle two lines of girders up to Type III (AASHO—PCI) with spans up to 80 feet. Or it will handle one line of Type IV girders with spans up to 100 feet. This bed has a tensioning capacity for two lines of 800,000-pound pull centered 30 inches above the casting bed. Depression forces of 25,000 pounds can be applied at any point in the bed.

The second new bed, designed for long-span single-tee sections, is 8 feet wide and 240 feet long. It produces tees up to 36 inches deep and with spans up to 120 feet. These members are used primarily for long-span building roofs.

Before construction of the new beds, the plant had two 420-foot beds for 48 × 14-inch Leap double tees and two 420 × 6-foot flat universal beds for beams, slabs, etc. One of these flat beds has now been converted to produce 48 × 8-inch flat, cored slabs for roof and floor members in 30 to 40-foot lengths.

Forms for the girders and single tees, as well as for the new flat, cored slab sections, were supplied by Food Machinery & Chemical Corp., Riverside, Calif. Cores in the slabs are formed by Food Machinery steel mandrels inside of corrugated paper tubes. The tubes are made by Fibreboard Paper Products Co., Oakland. The mandrels are withdrawn when the concrete is cured, and the paper tubes absorb shrinkage of concrete to eliminate binding of the mandrels.

Underground anchor slabs

The most unusual feature of the new beds is the method designed by Hoffman-Miller, Phoenix consulting engineering firm, to develop the vertical force necessary to overcome the eccentricity of the pretensioning load applied as high as 30 inches above the bed. In the older beds, a concrete anchor provides this force. Another method involves driving batter piles, but the presence of many large boulders in the subsoil ruled this procedure out.

The method adopted uses the weight of a large volume of compacted earth, materially reducing the required volume of concrete and reinforcing steel.

At each end of the bed, an excavation was carried down to a depth of 13 feet below grade, and a reinforced-concrete slab 15 feet square and 24 inches deep was cast. Embedded in this slab was a channel with 5-inch vertical riser pipes securely welded to it. The riser pipes extend up into the slab of the casting bed, where bearing members transfer horizontal loads into this 24-inch-deep reinforced-concrete slab. One of these pipes was set in line with each of the piers on the casting bed.

Structural-steel diagonal members extend from the tops of these pipes to the tops of the piers to transmit vertical loads.

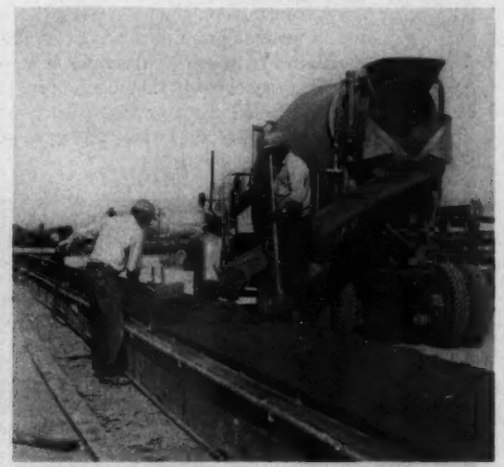
After the anchor slab had been cast, a backfill of reject rock and silt was placed and thoroughly compacted in shallow lifts. The entire area in which the beds were built consisted of a dump of reject rock from Superior's nearby gravel-producing operations. This material was excavated to a depth of 5 feet for the full length of the new beds. A mixture of rock and silt was brought back in and thoroughly compacted to provide the base for the bed.

Steel forms, ordinarily used in the prestressing plant, served as side forms for the new beds. Transit-mix concrete was supplied from Superior's nearby ready-mix plant and placed directly from the trucks.

Three lines of Superior 1¼-inch coil inserts were installed in the bed, with the inserts spaced at 30-inch centers in each line. Each of these inserts can resist an uplift force of 25,000 pounds. They are used pri-

In addition to the two new beds, the Superior plant has four 420-foot beds. Two are for 48 × 14-inch double tees; one is for beams, slabs, and other components; and one turns out 30 to 40-foot-long slabs that are used for roof and floor members.

Bill Hebets, manager of the prestress department, demonstrates a jacking yoke that adjusts to bring the frame into alignment with strands. Two sets of strands can be tensioned simultaneously.

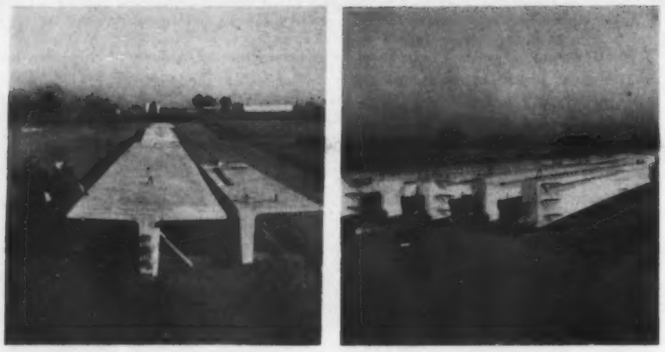


Crews cast double-tee sections in Leap forms. Concrete is chuted directly to the form by a Smith transit mixer operating from Superior's nearby ready-mix plant.

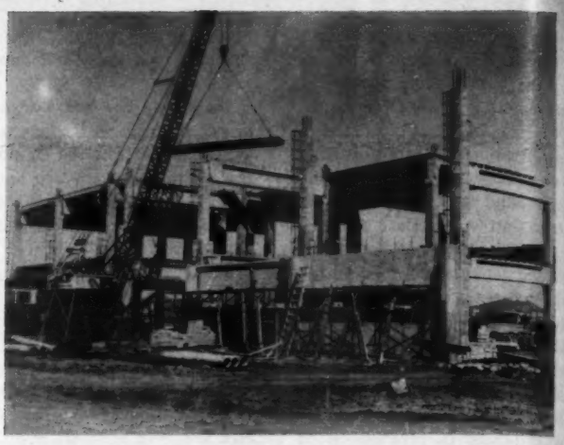
After the mix is consolidated with vibrators and the surface is screeded, workmen place ¼-inch dowels for shear reinforcement.

Hand troweling finishes the surface. This line of double tees is cast in 50-foot lengths. Since 1956, Superior has turned out over a million square feet of double tees.

Hot oil is piped to forms for curing. Recording thermometers keep a continuous record of temperatures. The new beds have steam for curing.



Big girders, right, that have been formed on the universal bed and big tees, left, are stockpiled in Superior's storage yard to await delivery to a job.



Double-tee sections turned out by Superior Sand & Gravel's Phoenix prestress plant are being set for the Sperry Phoenix building by a rented Bay City Cranemobile.

new

DIAMOND TUF-FLEX™

ROLLER CHAIN

The Roller Chain that can take more because it's built to give more!

DIAMOND *Tuf-Flex* is a rugged new *straight link* power transmission chain—especially engineered to provide extra durability and unusual flexibility to meet the strenuous service demands of heavy construction machinery. It is especially suited for equipment such as concrete transit-mix trucks and all types of power excavating shovels.

Proven advantages of *Tuf-Flex* are:

- **Longer service life**
- **Higher working load capacity**
- **Will accept greater misalignment of sprockets**
- **Greater capacity for shock and peak loads**
- **Easier chain connection**
- **May be used on existing sprockets of the same pitch**

*The trademark *Tuf-Flex* is the property of Diamond Chain Company, Inc.

Greater clearance between inside and outside linkplates, and between pins and bushings, permit extra flexibility and reduce stiffness after periods of idleness or exposure.
Up to 4° lateral displacement from center line per 4' of cham (above) and up to 8° of twist (right) accommodate sprocket misalignment due to twisting of machine's frame.
Tuf-Flex straight linkplates transmit loads in a straight line, utilizing maximum load capacity of linkplates, pins and bushings.
American Standard Dimensional Specifications permit DIAMOND Tuf-Flex to operate over existing sprockets cut for American standard roller chains of the same pitch, or equivalent offset side bar chains.
TUF-FLEX
Write today for new Tuf-Flex Bulletin No. 2600. Gives engineering features, construction details, specifications and prices.
DIAMOND CHAIN COMPANY, INC.
A Subsidiary of American Steel Foundries
Dept. 487, 402 Kentucky Ave., Indianapolis 7, Ind.
Offices and Distributors in All Principal Cities
DIAMOND ROLLER CHAINS

For more facts, use Request Card at page 18 and circle No. 282

(*Continued from preceding page*)

marily for deflecting the strands in girders.

Cure with hot oil

On the older beds, the prestressing strands—usually Roebling 7/16-inch—are tensioned simultaneously by a multiple pulling rig powered by a Rodgers pump and two 200-ton jacking cylinders.

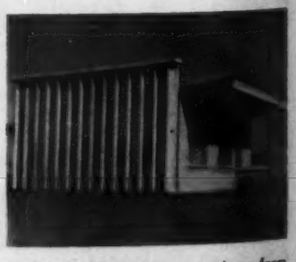
Forms are set and handled by an Austin-Western hydraulic crane mounted on a surplus truck. The crews place the concrete directly from transit mixers that drive along beside the beds. Small Dart vibrators usually consolidate the webs and other deep sections, while Mall vibrators are commonly used on the flanges or top sections.

As soon as the concrete has been cast and finished, the forms are covered with tarpaulins and heat is applied for curing. Hot oil is piped directly into the older beds from two hot-oil heaters. One of these is a Hopkins Volcanic Model 100. The other is a hot-water heater converted to oil. The oil, at 275 degrees, maintains a temperature of 140 degrees in the concrete.

Steam for new beds

Steam heat is being used in the new beds. The steam is piped to the beds from a Cleaver-Brooks 40-hp boiler. Recording thermometers in the beds keep a record of the actual curing temperatures.

After the curing period, the sections are removed from the forms by a Koehring 605 crane. Rented trucks deliver the finished sections to job sites, and rental cranes are used in



Prestressed double-tee sections form the side walls and roof of the unique prestress division office. The long overhang shades the windows during the hot summer.

cases where Superior does the erection.

Serve wide area

Superior's prestressing department started operations in February, 1956. Since that time the plant has produced more than a million square feet of double tees and a large volume of other products. These products have been delivered throughout Arizona.

For the Hughes Aircraft facility at Tucson, 110,000 square feet of sections was shipped 135 miles. On another job, a number of bridge sections with round voids were delivered beyond Holbrook for two highway structures on U. S. 66. This haul was over some rugged mountain roads.

In the Phoenix area, the plant's products have been incorporated into such projects as the Motorola Electronics Facility, Sperry Phoenix Plant, Tower Plaza Shopping Center, and many others. One project, the Kaibab rural elementary school, won a national award. Designed by architect Ralph Haver, the structure was built for less than $9.50 a square foot, which is cheaper than frame construction.

Personnel

Fisher Contracting Co.'s Superior Sand & Gravel Division operates under the direction of vice president Elmer D. Clark. Clark is a director of the Prestressed Concrete Institute. William H. Hebets is sales engineer and manager of the prestress department. William F. Wendland serves as the department's engineer. William J. Bickley is superintendent of the plant and erection operations.

THE END

Safety award presented

■ The Award of Honor of the National Safety Council was recently presented to Uhl, Hall & Rich, a partnership affiliate of Charles T. Main, Inc., Boston, Mass. As engineers to the Power Authority of the State of New York, the firm established a record of 1,269,912 injury-free man-hours during the construction of the St. Lawrence Power Project, covering the period from April 22, 1957, to December 31, 1959.

IRF recommendations for Central America, Panama

■ The International Road Federation, in a 90-page report prepared for the Ministers of Public Works of Central America and Panama, has recommended the creation of an Inter-American Highway Authority and the prompt completion of the Pan American Highway in those countries.

The report details construction and maintenance requirements, as well as cost estimates and proposals for the Inter-American Highway Authority.

Out of the 21,883 miles of the Pan American Highway in Mexico and Central and South America, less than 4 per cent is impassable. The chief bottlenecks are in Central America and Panama, and the Darien sections of Panama and Colombia.

RAW CINDERS FROM A VOLCANIC MOUNTAIN near Winona, N. Mex., are dozed an average of 300 yards in a single push by this International TD-25 crawler. The cinders, used by the Santa Fe Railway for ballast, are moved into a shallow trench where a slack-line bucket pulls them to a hopper for crushing and loading into gondola cars. Twenty-five cars are loaded during an average 8-hour day.

NYGEN-BUILT

GENERAL TIRES

keep downtime costs low
for higher profits on every job

Right now, tight-schedule projects the world over are rolling on time thanks to General Off-the-Road tires. Their exclusive Nygen-cord construction keeps them on the go come what may in the field. In sand, mud or gravel, General's deep traction, high flotation tread rolls units without let-up. That's why Generals never let you or your profit schedule down. Get first-hand proof on your next big project . . . specify General Off-the-Road tires.

THE GENERAL TIRE & RUBBER CO. · AKRON 9, OHIO

For more facts, use Request Card at page 18 and circle No. 283

Invention gets workout at prestressed plant as

Extruder capacity goes under test

Self-propelled and electrically run, a Dodd extruder made by Commodore Prestressed Machine Co. turns out 24-inch-wide floor panels with three voids at the plant of Winkrete Pre-Cast Co., Inc., which is testing the rig. Concrete is delivered to the hopper by a bucket handled by an overhead gantry. The mix is chuted to the bucket from the concrete plant outside.

Contractors and Engineers staff article

For the past few months a unique machine has been undergoing rigorous tests at the prestressed plant of Winkrete Pre-Cast Co., Inc.—a division of D. W. Winkelman Co., Inc., Syracuse, N. Y.—so that its capacity and working specifications can be determined.

This pilot model, known as the Dodd extruding machine, was developed and manufactured by the Commodore Prestressed Machine Co., Inc., Nashville, Tenn. Winkrete, under general manager Ralph Woodruff, is handling the tests.

Floor beams produced

At present, the Dodd extruder, which operates something like a slip-form paving machine, is capable of producing prestressed-concrete floor panels 24 inches wide with three voids and varying in thickness from 6 to 10 inches. The section is formed completely by the machine; no side or void forms are needed. Bulkheads are also eliminated, for a continuous ribbon of floor paneling is extruded for the entire length of the testing bed.

The various lengths required are obtained by sawing the concrete with a portable concrete saw equipped with two abrasive blades spaced about 3 inches apart. The double cut is made after the extruder completes its pass down the casting bed. This cut is carried down to the row of prestressing cables along the bottom of the floor panel. After the concrete is cured and reaches its required strength, the strands are cut, by the saw, as the panel lengths are severed. This transfers the load in the cables to the floor panel.

Self-propelled machine

The new electrically operated and self-propelled machine guides itself along the stressed strands. It is equipped with two vibrators: one for the top plate that strikes off the surface of the floor panels; one for the tubes that form the voids.

There is also a reduction-drive motor to power the four wheels of the extruder. The travel speed can be varied, as can the top plate, in order to adjust the feed of the concrete mix. A small compressor is mounted on

The rig guides itself along prestressed strands on wheels powered by a reduction-drive motor. Speed and top plate can be adjusted to feed the mix, and many variations are made during tests. Panels range from 6 to 10 inches deep. Note top reinforcing being embedded in the beam; bottom mesh has been removed to determine the drag developed by the rig as it moves along the bed.

STEADY PRESSURE for McKiernan-Terry 9B-3 Hammer with Jaeger "600".

MORE AND MORE CONTRACTORS ARE FINDING OUT . . .

AIR COSTS LESS WITH A JAEGER ROTARY

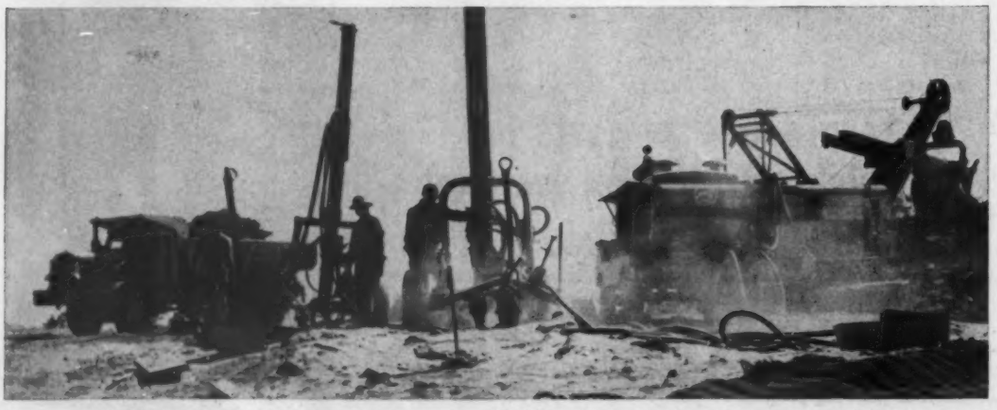
Why do you suppose the men who use Jaeger "600" compressors behind big pile hammers say the Jaeger *"is as smooth as steam"?* Air demand fluctuates violently when you operate a big McKiernan-Terry or Vulcan driver. Jaeger automatic control of engine and compressor is so smooth, so closely regulated, *so instant acting,* that air pressure is held constant under all normal operating conditions. Keeps the tools operating at top efficiency, without over-run, engine racing, wasteful use of fuel.

PAYS OFF ON DRILLING, TOO

The Jaeger "600" also *proves* its greater efficiency by producing full rated capacity at 100 rpm slower speed than others—1700 rpm instead of 1800 rpm — *using the same GM Diesel 6-71 engine.* You save fuel, save engine and compressor wear every hour you work. More than 500 cf of air per pound of fuel, and often as many as 8,000 hours without a vane replacement, are the proof.

Ask your Jaeger distributor for the cost-saving figures on any size Jaeger Rotary — 75 to 900 cfm, or send for new Catalog JC-0.

BELOW: DRILLING SHOT HOLES AHEAD OF BACKHOE on 10½ mile trenching job for big Eastern steel company's research center. Two Jaeger "600" compressors supplied low-cost air.



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Jaeger Machine Company of Canada, Ltd., St. Thomas, Ontario.

Worldwide sales and service through Jaeger International Corp., Apartado 137, Panama, R. P.

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the extruder to provide an oil spray for all moving parts.

Winkrete has been using varying forward speeds with different feed rates to determine the most efficient relation between the two. This is influenced, naturally, by such factors as slump and water content of the concrete mix, the positioning of the wire-mesh reinforcing, the type of bond created with the casting-bed slab, and the weight of the concrete loaded into the rig's hopper.

Conventional method

Adjacent to the 200-foot-long casting bed on which the extruder is being tested is another 200-foot bed using conventional methods to produce prestressed floor panels. This bed has steel forms capable of producing three lines of floor panels simultaneously.

The Roebling strands are pulled manually from the strand rack at the dead end of the bed and fastened to the live end by strand vises. About 18 inches of cable is left extended so that another strand vise can be placed at the end. This end vise is then fitted into the jaw attached to the ram of the hydraulic jack. All strands are stressed individually. During elongation, the vise at the anchor is kept snug by being pushed against the anchor. A Rodgers hydraulic pump powers the jack during this operation.

After the strands are fully loaded, the forms oiled to prevent bond, and steel fillers attached to the forms to shape the side keys of the floor panels, two pneumatic tubes are placed in each casting line, together with the required bulkheads. These tubes are then inflated to form the double void in each panel; later they are deflated for removal.

All the concrete mix for the precast and prestressed operations is supplied by a Burmeister batch plant equipped with two mixers.

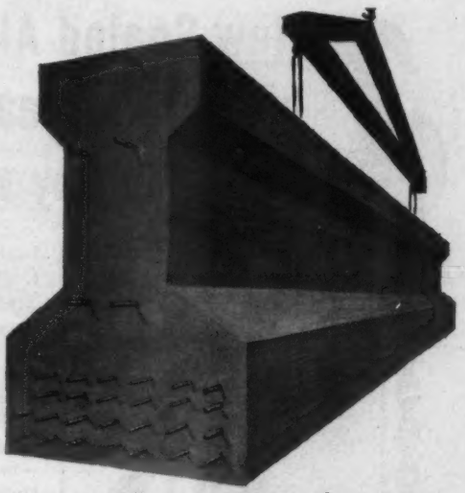
Two-way chutes make it possible for concrete to be batched into the building that houses the prestressing operations or to batch trucks hauling to other locations. The plant, equipped with two 600-barrel cement silos, is charged by an inclined con-

(Continued on next page)

No-slump concrete is used for the ribbon of concrete cast on the 200-foot bed. Another 200-foot bed uses conventional methods to produce floor panels. On the test bed, panels are sawed to required lengths. The rig has two vibrators, one for the top plate that strikes off the panels, one for the tubes forming voids.

A Wright 10-ton overhead gantry handles a concrete bucket used in the precasting operation. Two of these gantries, remotely controlled by operators on the floor, serve the casting area.

FULL LINE OF DEPENDABLE *Richmond* PRODUCTS FOR EVERY KIND OF PRESTRESSED CONCRETE MEMBERS *saves time & money safely!*



Richmond, to meet growing demands created by the continually increasing use of prestressed concrete, has developed a full line of dependable, quality-tested strand deflectors, lifting inserts, void supports, anchors, all types of threaded inserts, form hangers and accessories for prestressed concrete beams, piles, slabs and girders.

These products have been designed and engineered, with the know-how gained thru 49 years of experience, to meet the needs of new, improved techniques in strand deflection, void support, lifting of and anchoring to prestressed members.

Richmond Strand Deflection Inserts for prestressed concrete beams and girders. In addition to the standard line of inserts, special units can be manufactured to suit individual needs.
Richmond Chairs and Spacers for void supports and spirals in prestressed piles and beams.
Richmond Inserts for connection of cast-in-place diaphrams to prestressed girders.
Richmond inserts for anchoring to or hanging from prestressed members.
Richmond Extended Coil Tysrods for lifting prestressed beams and girders. (2 & 4 strut)
Richmond Inserts for anchoring guard rails to prestressed girders.
Phillips Self-drilling Concrete Anchors for anchoring to any concrete members after the concrete has set.
Richmond Offset Free-Fit Hanger Frame-Tys used to hang forms from prestressed "I" beams.

Shown here are a few of the many Richmond-engineered products for the prestressed concrete construction industry. For more information about them, or help with any specific concreting problem, write to:

MAIN OFFICE: 816-838 LIBERTY AVENUE, BROOKLYN 8, N. Y.
Plants & Sales Offices: ATLANTA, GEORGIA; FORT WORTH, TEXAS; ST. JOSEPH, MISSOURI; LAUREL, MARYLAND.
In Canada: ACROW-RICHMOND LTD., ORANGEVILLE, ONTARIO.

VISIT US AT THE 6TH PRESTRESSED CONCRETE CONVENTION BOOTH 48, STATLER HILTON HOTEL, N. Y.—SEPT. 27-28-29-30

Richmond SCREW ANCHOR CO., INC.
INSIST ON RICHMOND AND BE SURE IT'S RICHMOND!
ASSOCIATE MEMBER PCI

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This Burmeister batch plant just outside the building is equipped with a 2-way chute so that concrete can be batched directly into the building or to trucks hauling to a job site. Inside the building, concrete buckets are handled by overhead cranes.

One of the crew uses an icebreaker to keep the inner strand vise snug against the anchor column as the hydraulic jack elongates the strand.

Winkrete uses a Clarklift fork-lift truck to stockpile and to load completed prestressed-concrete components onto trailer trucks for shipment. Double-tee beams are being loaded here.

(*Continued from preceding page*)

veyor belt that transfers aggregates from a hopper.

Concrete being batched into the building falls down a chute and into a concrete bucket handled by one of the two Wright 10-ton overhead gantries. These electrically operated gantries, straddling the entire prestressing area, are remotely controlled from the ground.

As the various components are completed and stripped from the [illegible] floor-beam beds and the univers[illegible] bed, the sections are handled by the gantries and temporarily stockpiled at the dead-end area of the building. Winkrete uses a Clarklift fork-lift to move the members to an outside storage area. This rig is again used to load components onto trailer trucks making deliveries.

THE EDS.

ARBA publishes two new bulletins

■ Two new technical bulletins have been published by the American Road Builders' Association.

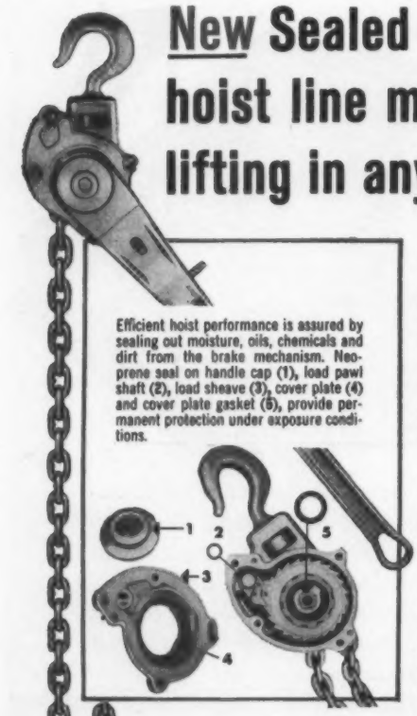
"Michigan Experiments with Sodium Chloride Stabilization," Bulletin 247, describes a study to determine the value of increased amounts of sodium chloride for improvement of soil aggregate mixtures.

"Mixed-in-Place Soil-Cement Street Construction in North Dakota" covers a contractor's experience in his first year in the soil-cement construction field and includes a discussion of the equipment investment required and the techniques employed.

Both bulletins are priced at 50 cents per copy and can be ordered from the association, World Center Bldg., Washington 6, D. C. ARBA members in good standing are entitled to a free copy of each.

For more facts on Insert, use Request Card at page 18 and circle No. 286 ▶

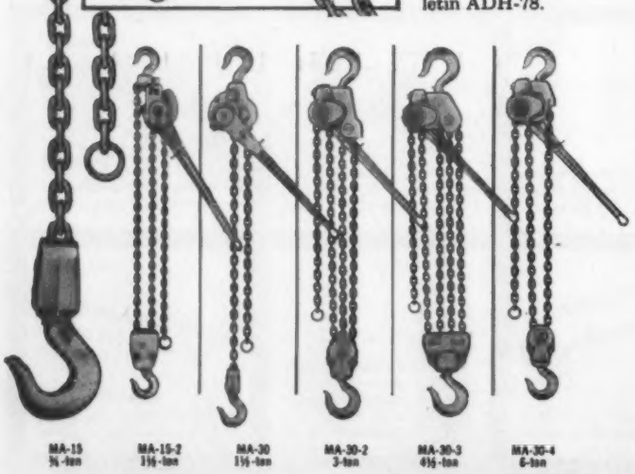
New Sealed Aluminum hoist line means easy lifting in any weather!



Efficient hoist performance is assured by sealing out moisture, oils, chemicals and dirt from the brake mechanism. Neoprene seal on handle cap (1), load pawl shaft (2), load sheave (3), cover plate (4) and cover plate gasket (5), provide permanent protection under exposure conditions.

Lifting is easy with the Coffing Sealed Disk Brake Lever hoist because the handle pull to lift rated load requires only 57 pounds with the ¾-ton model to 93 pounds with the 6-ton model. Load spotting is precise—to within minute fractions of an inch. The sealed feature prevents brake slippage under adverse exposure conditions.

The high strength aluminum alloy frame is light—makes for easy portability. Ask your distributor or write for Bulletin ADH-78.



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DUFF-NORTON COMPANY

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DUFF-NORTON JACKS
Ratchet • Screw
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Suction • Water • Steam
Air • Multi-Purpose
Discharge • Pile Driver

Wherever your job is—*whenever* you need hose—there's a Continental Warehouse nearby stocked to give you any kind of hose you want—*when* and *where* you want it.

There's no need to wait for distant shipments—no need to stop the job—no need to lose profits.

Any time you need hose call Continental. You'll like the fast service and dependable quality you get from these warehouses:

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BOSTON, Mass.	DETROIT, Mich.
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CONTINENTAL RED-STRIPE AIR HOSE
Made to take severest punishment in mines, quarries and tough construction jobs. Up to 8 plies of high-strength hose fabric. Won't weaken under pressures to 250 p.s.i. Oil-proof neoprene tube. Sizes from ½" thru 3". Ask for catalog showing complete line of CONTRACTORS HOSE, HOSE FITTINGS, BOOTS and CLOTHING.

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Top Performance

...a result of technical exploration

Whether at the poles or in the plant, exploration is the key to technical progress. So it is at Yale & Towne — where Trojan engineers design, develop and test materials and methods that make Trojan tractor shovels the Top Performers on thousands of jobs from busy local streets to barren foreign wastelands.

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TRACTOR SHOVELS
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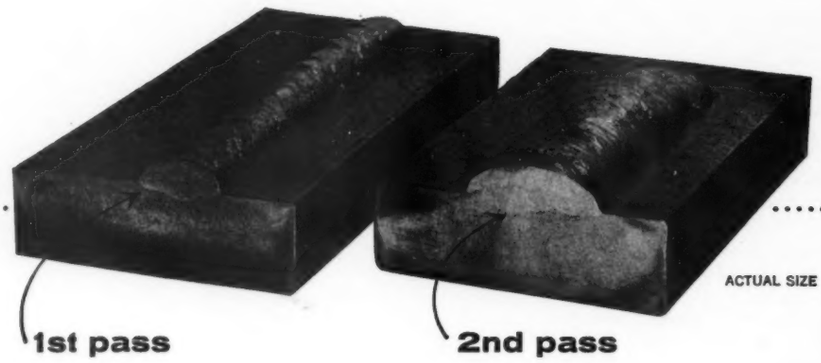
(Iron Powder Coating)



Compare the new Stoody Build-Up with any other material of this type. It gives you:

SPEED.....15% to 50% faster deposit rate

BUILD-UP.....Higher—with sound deposits

ECONOMY.....High welding efficiency gives lower cost per pound of deposit

WELDABILITY.....Stable arc—low spatter—less smoke

OTHER FEATURES....Higher tensile strength—low crack sensitivity—excellent machinability

Use Stoody Build-Up for

- Shafts (to be machined)
- Gear Teeth
- Sprockets
- Tractor Rails
- Churn Drills
- Build-up on carbon steels for hard-facing overlay

See your Stoody dealer for complete information (check the Yellow Pages of your phone book) or write to

STOODY COMPANY
11904 East Slauson Avenue, Whittier, California

For more facts, use Request Card at page 18 and circle No. 289

D. V. Buttenheim named to ARBA committee

■ Recently appointed to a committee that will study and evaluate the American Road Builders' Association's position on the financing of federal-aid highways was Donald V. Buttenheim, president of the Buttenheim Publishing Corp. that publishes CONTRACTORS AND ENGINEERS.

The committee, headed by Harold L. Aitken, director of the District of Columbia Department of Highways and Traffic, will report back to ARBA's executive committee on the stand the association will take in 1961, when highway financing will be a major problem of the 87th Congress.

Other members of the committee are: Mason Butcher, director, Montgomery County Department of Public Works, Rockville, Md.; E. B. Cape, president, E. B. Cape Co., Houston, Texas; C. Cheever Hardwick, Smith, Barney & Co., New York City; Robert Holmes, U. S. Steel Corp., Pittsburgh, Pa.; Enoch R. Needles, Howard, Needles, Tammen & Bergendoff, New York City; Boyd S. Oberlink, senior vice president, Allis-Chalmers Mfg. Co., Milwaukee, Wis.; and Rex M. Whitton, chief engineer, Missouri State Highway Commission, Jefferson City, Mo.

Cement company initiates weather-forecast service

■ A monthly weather report, with color-coded charts and weather maps that tell at a glance what areas are expected to be colder or warmer, wetter or drier for the next thirty days, has been made available by Alpha Portland Cement Co., Easton, Pa., to its customers in the eastern part of the country. The purpose is to supply users of cement with information that will help them guard against losses caused by weather.

The detailed information, supplied by Weather Trends, Inc., a New York firm of meteorologists specializing in long-range forecasting, is contained in a 4-page bulletin, with specific data on each major region and key cities.

ASCE elects four men to honorary membership

■ Four engineers have been named honorary members of the American Society of Civil Engineers, the highest honor bestowed by the society.

The four are Guy F. Atkinson, chairman of the board of Guy F. Atkinson Co., South San Francisco, Calif.; Frank Kerekes, dean of faculty, Michigan College of Mining and Technology, Houghton, Mich.; Solomon C. Hollister, dean of the college of engineering at Cornell University, Ithaca, N. Y.; and Fred C. Scobey, construction hydraulic engineer, Berkeley, Calif.

Honorary members selected by ASCE must have attained eminence in some branch of engineering of the sciences related to engineering, and the number elected in any year does not exceed one for every 7,500 members.

AN INTERESTING DESIGN in prestressed-concrete construction is seen on the new U. S. Embassy building in London, England. British Ropes, Ltd., supplied the reinforcing wire that was used.

CONCRETE FORMING PROBLEMS

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BY RENTING **UNI-FORM PANELS**

Over the years thousands of contractors have rented UNI-FORM Panels to form concrete and save money on almost every conceivable type of job, from house foundations to mammoth industrial projects. Renting UNI-FORM Panels is simple . . . You send us a set of plans and we will send you a rental proposal based on what you would need. You will get a tailor-made forming system delivered to your job. But the big advantage is that you will be able to use a forming system that will out-perform any other method you might use. Write today for the complete story on UNI-FORM Panels or send us a set of plans; either way we will be glad to hear from you.

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Autocar Way. All rotating parts, including rear wheels, are balanced both individually and in assembly.

Better Balance...as you find it in the "World's Finest"

Better balance means improved performance. Means less maintenance. Means more driver comfort.

Better balance is an exclusive Autocar quality. Every rotating component in an Autocar is balanced with meticulous care. Hubs and drums, wheels, front and rear tires, for example, are balanced both individually and in assembly. Drive shafts are balanced at speeds up to 3,000 rpm to within *one ounce inch.*

That's balance. That's quality. That's how Autocar provides the greatest performance. Why take less than the "World's Finest"?

Autocar
"World's Finest"

Division of
The White Motor Company, Exton, Pa.

For more facts, use Request Card at page 18 and circle No. 291

Convention Calendar

September 11–16 Management Development Conferences
Conferences, California Institute of Technology, Pasadena, Calif. Management Development Center, California Institute of Technology, Pasadena, Calif.

September 12–23 Fundamental Principles of Nondestructive Testing
Summer Conference Course, Ohio State University, Columbus, Ohio. Dr. Robert C. McMaster, Dept. of Welding Engineering, Ohio State University, 190 W. 19th Ave., Columbus 10, Ohio.

September 15–16 Engineering Management Conference
Joint meeting of ASME and AIEE, Hotel Morrison, Chicago, Ill. A. B. Conin, Jr., American Society of Mechanical Engineers, 29 W. 39th St., New York 18.

September 19–21 County Division of the American Road Builders' Association
Eighth Annual National Highway Conference, Atlanta Biltmore Hotel, Atlanta, Ga. Ben F. Ostergren. County Division, ARBA, World Center Building, Washington 6, D. C.

September 26–29 American Welding Society
Fall meeting, Penn-Sheraton Hotel, Pittsburgh, Pa. F. J. Mooney, AWS, 33 W. 39th St., New York 18, N. Y.

September 27–30 Prestressed Concrete Institute
Sixth Annual Convention, Statler Hilton Hotel, New York, N. Y. Norman L. Scott, executive secretary, 205 W. Wacker Drive, Chicago 6, Ill.

October 3–5 National Association of Corrosion Engineers
Short course, San Francisco, cosponsored by NACE and University of California. Dr. I. Cornet, University of California, Engineering and Sciences Extension, 2451 Bancroft Way, Berkeley 4, Calif.

October 3–5 National Association of Corrosion Engineers
Short course, University of Oklahoma, Norman, Okla., cosponsored by NACE and University of Oklahoma. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 4–6 Producers Council, Inc.
Meeting, Drake Hotel, Chicago, Ill. Keith R. Belch, 2029 K St. N.W., Washington 6, D. C.

October 4–7 Ohio Short Course on Roadside Development
Nineteenth annual course, Neil House, State Office Building, and Ohio Union, Ohio State University, Columbus, Ohio. Wilbur Garmhausen, Ohio Department of Highways, 450 E. Town St., Columbus 15.

October 6–7 National Association of Corrosion Engineers
Western Region Conference, Sheraton-Palace Hotel, San Francisco, Calif. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 6–8 National Association of Corrosion Engineers
Southeast Region Conference, Dinkler-Plaza Hotel, Atlanta, Ga. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 10–14 American Society of Civil Engineers
Annual meeting, Hotel Statler, Boston, Mass. W. H. Wisely, ASCE, 33 W. 39th St., New York 18, N. Y.

October 11–14 National Association of Corrosion Engineers
Northeast Region Conference, Prichard Hotel, Huntington, W. Va. T. J. Hull, executive secretary, NACE, 1061 M & M Bldg., Houston 2, Texas.

October 17–21 National Safety Council
48th annual National Safety Congress, Conrad Hilton and other hotels, Chicago, Ill. R. L. Forney, NSC, 425 N. Michigan Ave., Chicago 11, Ill.

October 19–20 National Association of Corrosion Engineers
North Central Region Conference, Pfister Hotel, Milwaukee, Wis. T. J. Hull, executive secretary, 1061 M & M Bldg., Houston 2, Texas.

October 25–27 National Association of Corrosion Engineers
South Central Region Conference, Mayo Hotel, Tulsa, Okla. T. J. Hull, executive secretary, 1061 M & M Bldg., Houston 2, Texas.

October 31–November 2 American Concrete Institute
Semiannual regional meeting, Pioneer Hotel, Tucson, Ariz. William Maples, ACI, P. O. Box 4754, Redford Station, Detroit 19, Mich.

November 1–4 American Institute of Steel Construction
Annual convention, Greenbrier Hotel, White Sulphur Springs, W. Va. AISC, 101 Park Ave., New York 17, N. Y.

November 3–4 National Slag Association
Annual meeting, Hotel Mayflower, Washington, D. C. NSA, 613 Perpetual Building, Washington 4, D. C.

November 14–15 Prestressed Concrete Conference
Meeting, sponsored by the University of California Extension and Department of Engineering, Biltmore Hotel, Los Angeles, Calif. Dept. of Conferences, University Extension, University of California, Berkeley 4, Calif.

November 14–16 National Association of Corrosion Engineers
Canadian Region (Eastern meeting), Sheraton Mount Royal Hotel, Montreal, Que., Canada. T. J. Hull, executive secretary, NACE, 1061 M & M Building, Houston 2, Texas.

November 14–17 American Bridge, Tunnel and Turnpike Association
Meeting, Atlantic-Sheraton Hotel, New York, N. Y. J. Allyn Stearns, executive secretary, Northcourt Bldg., White Plains, N. Y.

November 14–18 Short Course on Concrete and Concrete Aggregates
Course, sponsored by National Sand and Gravel Association and National Ready Mixed Concrete Association, University of Maryland, College Park, Md. NSGA-NRMCA, 1411 K St. N.W., 10th Floor, Washington 5, D. C.

November 21–22 Prestressed Concrete Conference
Meeting, sponsored by the University of California Extension and Department of Engineering, Sheraton-Palace Hotel, San Francisco, Calif. Department of Conferences, University Extension, University of California, Berkeley 4, Calif.

November 27–December 2 American Society of Mechanical Engineers
Winter annual meeting, Statler Hilton Hotel, New York, N. Y. L. S. Dennegar, ASME, 29 W. 39th St., New York 18, N. Y.

November 28–December 2 American Association of State Highway Officials
Meeting, Sheraton-Cadillac Hotel, Detroit, Mich. Michigan State Highway Department, Lansing 26, Station A, Mich.

The Highway Trust Fund is entering its fifth year of operation with a balance of nearly $119 million, or $110 million more than estimated.

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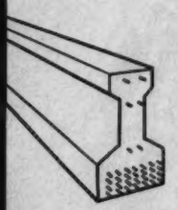
153-TON LOAD—more than four times design load. Deflection was 24 inches with no failure of concrete or strand. Test made for acceptability of 1400 girders for South Vietnam construction project.

LOADS REMOVED—approximately 85% recovery of deflection immediately. Only hairline cracks evident. Designer—Capital Engineering Corp.; General Contractor—Johnson, Drake & Piper of Vietnam, Inc.; Technical Assistance—Freysinnet Co., Inc.



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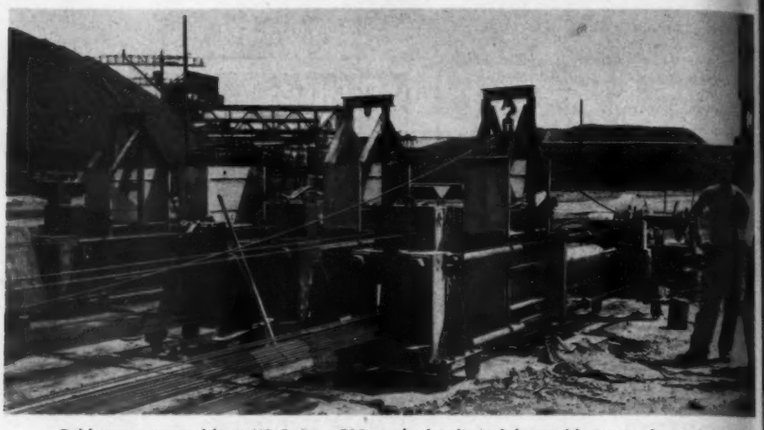
For more facts, use Request Card at page 18 and circle No. 292

PRESTRESSING

Two 600-foot-long prestressing beds, left, and two 400-foot beds, right, are being used by Precrete, Inc., to turn out a number of different types of concrete components for commercial use. All beds have intermediate anchorages to break them into 200-foot and 400-foot units.

Working behind the jacking end of a casting line, an electrically operated winch pulls the strands, and a spacing template, from the dead end of the line. The winch, on rails, can be positioned behind the live or jacking end of any bed.



Cables are stressed by a W. S. Pine 500-ton hydraulic jack located between the anchor column and the push plate, which is tied to the strand template by four pull rods. The hanging block over the anchor column supports the cable from the winch.

by ANTHONY N. MAVROUDIS, field editor

Four long casting beds and good ideas produce

Quality items with minimum effort

With four prestressing beds—two having effective working lengths of 600 feet and two with lengths of 400 feet—plus an experienced crew, Precrete, Inc., Long Island City, N. Y., has developed an operation that produces quality products, at a high rate and with a minimum of effort.

This commercial prestressed producer handles many variations of components.

In 1957, Precrete moved operations to the present Astoria, Long Island, site, which is on the waterfront, and built the two 400-foot casting beds. During 1958, the two 600-foot beds were added to meet the growing demand for prestressed components throughout the New York City metropolitan area.

All beds were built with intermediate anchorages to gain flexibility and the economy possible with the saving on strand lengths. With anchor col-

A truck crane positions steel side forms along one of the four casting lines of the two 600-foot beds. Strands are stressed in the line at left.

Side forms are held plumb by threaded rods passed through the bases of the forms and pallet liners, and by spreader bars between the top flanges of both side forms.

Concrete is brought to the forms by a truck with a Dumpcrete body and chuted into place. Concrete crews use Thor vibrators to consolidate the mix as it is being placed.

Tarps are used to cover the forms; steam for curing is turned on. Flexible lines are attached to steam lines buried underground between the beds.

After the proper load is placed on the strands, bulkheads are positioned for units to be cast. A flag is used to signal the winch operator to stop the forward motion of the wheel-mounted spacer.

A triple-notched steel plate is used to gather the strands into three vertical rows so that bulkheads can be placed. A 2-man crew following the spacing template handles the job.

After steel bulkhead plates are placed over the grouped prestressing strands, three flat spacer bars obtain proper horizontal spacing and position cables in cutout sections of bulkhead plates.

Steel filler jigs are bolted into position in the bulkhead openings to permanently fix the spacing of the strands and to reduce the openings in the bulkheads. This completes the positioning.

umns installed in these intermediate anchorages, the two 400-foot beds can be broken down into four 200-foot beds. The two 600-foot beds can be broken down into two 200-foot and two 400-foot beds by the installation of the anchor columns at only one of the third-points of the beds.

Precrete chose these 200 and 400-foot-length divisions because past experience showed them to be the most efficient. Each bed is 10 feet wide and capable of casting two lines, and each can handle up to 2,000,000 pounds of pull. A bed has two anchor columns at each end for stressing each of the two lines. If, however, one bed is to be used to stress single-line large components, such as 8-foot 6-inch-high girders, both anchor columns on the bed can be used.

Winch pulls strand

Precrete uses an electrically powered winch, riding on rails laid transversely behind the live or jacking ends of the four beds, to pull the prestressing strands for each line. This winch can be moved to each one of the jacking positions. By means of a cable attached to a strand template, it can pull, simultaneously, all the strands required.

At the opposite or dead end of each pair of beds is a strand rack. The one at the dead end of the 600-foot beds has a capacity of 60 reels; the rack at the dead end of the 400-foot beds has a 40-reel capacity. The cables are connected to the strand template at the dead end by Supreme strand vises and are pulled to the jacking end on a wheel-mounted dolly. After the strand template reaches the live end, the vises are removed so that the strands can be attached to the jacking template. This connection is again made by the strand vises. The cables are then cut loose from the reels and fastened by vises to the dead-end anchor.

All the strands in each beam are stressed simultaneously in one operation. A uniform pull in every strand is assured by equalizing each length before the stressing begins. The customary method in most plants is to apply a 1,000-pound load by dynamometer to each strand. In lieu of this time-consuming operation, Pre-

(Continued on next page)

Control concrete setting with J-M Retardwel...

the hot weather admixture that gives up to 50% higher 24-hour strength

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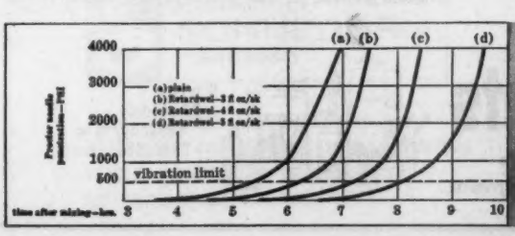
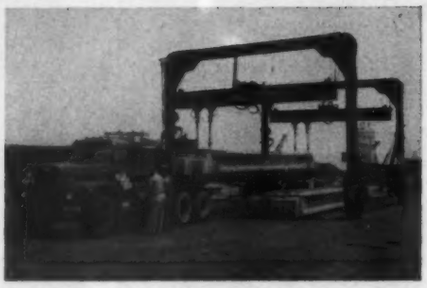


For more facts, use Request Card at page 18 and circle No. 293

The 48-inch ram of the W. S. Pine 500-ton jack pushes against the push plate as cables are stressed. The push plate is attached to the strand template on the opposite side of the anchor column by four pull rods.



A 25-ton Travelift is used to load sections onto a trailer truck for shipment. The Travelift also stockpiles completed prestressed components at the yard.

(Continued from preceding page)

crete uses a simpler means to provide a common start-off point for the stressing of all strands. The strand assembly is first pulled up to about 20 per cent of the required total elongation and then released again. After the pressure has been released, the stressing head retracts into approximately its original position. The anchors on the shortest strands remain snug against the stressing head and the others can be tightened by hand. This method does not remove the slack from the wires but makes them reasonably uniform. Several tests proved that this expedient system is just as accurate as the individual 1,000-pound pull.

Strands stressed

The actual stressing operation is handled by a W. S. Pine 500-ton hydraulic jack, having a maximum ram of 48 inches, which is positioned between the anchor and a push plate. This movable push plate is connected to the strand template on the opposite side of the anchor column by four 2½-inch pull rods. As the ram of the jack acts against the push plate, its elongation is transmitted to all the cables attached to the strand template.

The load applied to each strand is determined by the elongation of the jack's ram. For the strands on the 600-foot beds, the elongation varies, according to design load, from 45 to 51 inches. Whenever this figure exceeds the ram capacity, the pull-rod nuts are taken up against the anchor column to maintain the strand load while the ram is retracted and the push plate reset for further jacking. Once the proper strand elongation has been obtained, the pull-rod nuts are again tightened against the anchor column to permit removal of the jack.

Bulkheads positioned

With the proper load on the strands, the winch is again used to pull a steel wheel-mounted template to properly space and lift the strands. This operation is necessary for the positioning of the steel bulkheads that space the various component lengths per casting line.

One man in the 2-man crew that handles the bulkhead placing uses a flag to signal the winch operator when to stop the travel of the spacing template. This is done at every bulkhead location. A triple-notched steel plate is used at each bulkhead to gather the strands into three vertical rows so that the steel bulkhead plates can be slipped over the strands.

After the two bulkheads are positioned over the strands, flat spacer bars are fitted down between the strands and twisted in order to obtain the proper horizontal spacing of the cables. Steel filler jigs are then bolted into position in the bulkhead openings to permanently fix the spacing of the strands and reduce the openings in the bulkheads. This eliminates excessive leakage of concrete from the forms.

The shop-fabricated steel side

On more than 80% of all dam projects in the past 10 years, Gar-Bro's big heavy duty concrete buckets have been used. This is also true about most smaller concrete construction jobs where Gar-Bro Concrete Buckets are preferred by contractors. That's why we can say, "The best dam* concrete and the most concrete passes thru the grout-tight, self-closing, non-jamming double clamshell gates of Gar-Bro Concrete Buckets."

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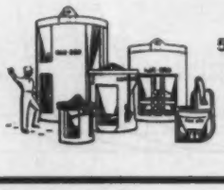

5 types
29 models
capacity/⅛ to 8 cubic yards

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A Lorain truck crane uses a laydown bucket to fill forms for an 8-foot-deep prestressed girder being cast on a 400-foot bed.

forms are handled by a Lorain truck crane that positions the form sections on each side of the pallet liner of a casting line. The side forms are held in position by a spreader bar inserted between the top flanges of both forms and by a rod passed through openings along the bottom flange of the forms and bolted at both ends. This draws up the side forms against the bottom pallet liner.

Concrete operations

Concrete for the yard is supplied by a Blaw-Knox batch plant equipped with a Worthington 3-yard mixer. The plant also includes a 1,700-barrel cement silo and a 75-yard 4-compartment aggregate bin. Cement, sand, and stone can be delivered to the plant by truck or barge. An air pump transfers it through a line that runs to the top of the silo.

Concrete for the entire plant is supplied by this Blaw-Knox plant with a Worthington 3-yard mixer. The plant has a 1,700-barrel cement silo and a 75-yard 4-compartment aggregate bin charged by conveyor belt.

Aggregates, stockpiled around the plant, are transferred to the aggregate bin by a Yale & Towne Trojan front-end loader that feeds a hopper and inclined conveyor leading to a 4-way chute atop the bin. Darex air-entraining agent is added at the plant to provide a more workable mix. When specified, Sonotard or Plastiment is added for water reduction.

Concrete is hauled from the plant by two batch trucks equipped with Dumpcrete bodies and chutes. The mix is deposited directly into the previously oiled forms and is consolidated by Thor electric vibrators.

After concrete is placed in the entire casting line, tarpaulins are placed over the forms. These tarps are fastened to reinforcing bars that are attached to the top flange of the side forms. This eliminates any extra handling of the covers.

Once the tarps are in place, steam produced by Cyclotherm 150-hp and 35-hp steam generators is turned on to start the curing process. Precrete has steam lines running in the ground between the two pairs of beds. Flexible hoses with nozzles on 20-foot centers are connected to exposed couplings located at uniform intervals along the casting beds.

With 10 hours of steam curing, plus the use of high-early cement, the concrete reaches strengths between 4,500 and 5,000 psi so that side forms can be stripped the following day.

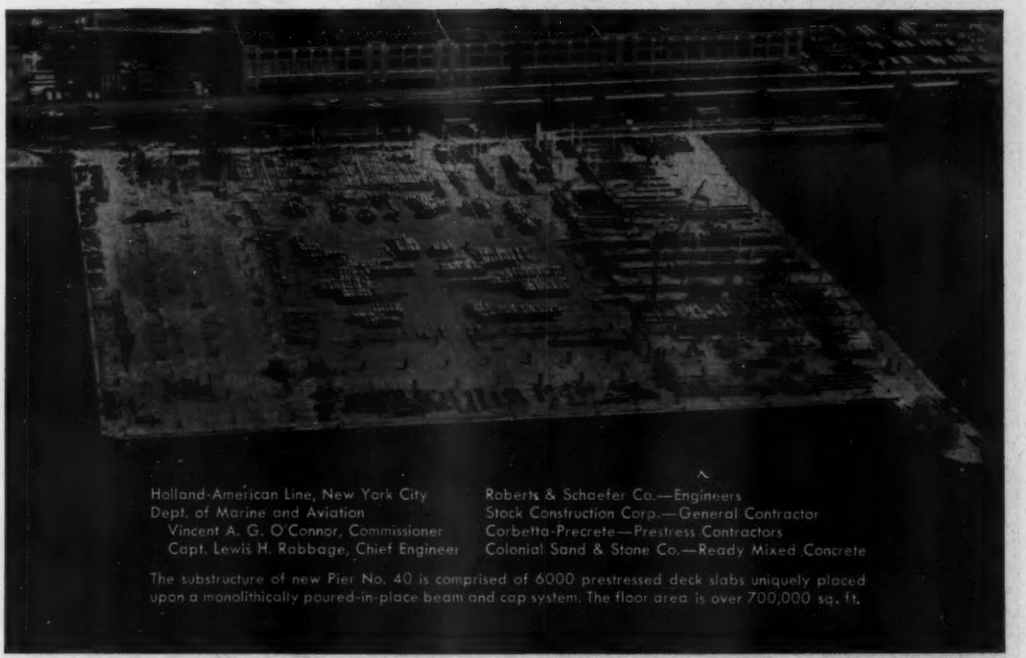
Precrete has a Travelift, with a 25-ton capacity, to handle the stockpiling of finished components and the loading of trailer trucks with shipments. After a casting line is detensioned by replacing the jack and reversing the tensioning process—thus transferring the cable-stressing load into the concrete members—the cables between bulkheads are cut by a torch. The sections are then lifted off the casting line by the crane and laid alongside the bed for stockpiling by the Travelift.

As concrete is placed in the forms, it is vibrated with Thor electric vibrators by the concrete crew. Tarps, attached to the sides of the forms, are easily handled.

Precrete's labor force varies between 40 and 100 men, depending on the work load. Production averages about 1,000 linear feet of prestressed-concrete components per 8-hour day.

John Johnson is the superintendent in charge of the plant operation and production. THE END

Controlled Concrete with
SONOTARD
for New York's Largest Pier now under construction



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The substructure of new Pier No. 40 is comprised of 6000 prestressed deck slabs uniquely placed upon a monolithically poured-in-place beam and cap system. The floor area is over 700,000 sq. ft.

• **SONOTARD** is being used in *all* concrete to produce consistent and uniformly high strengths required for the heavy live loads to be handled, plus maximum density to resist erosion from sea water.

• A high degree of workability to facilitate placement has been maintained through high summer heat and a winter which recorded a low mark for sustained cold weather.

• The quantities of **SONOTARD** used were varied according to temperature to keep the water content and rate of hardening constant. At all temperatures **SONOTARD** produced a uniformly high strength with maximum density and eliminated shrinkage and cracking.

• **SONOTARD** played an essential role in the prestressed deck slabs and beams by controlling the initial rate of hardening and fluidity of concrete for optimum placement properties.

• **SONOTARD** speeded the strength development (15 hours of steam cure averaged over 4500 psi) permitting early release of tension and early stripping of forms.

• Since **SONOTARD** does not increase the air content while reducing water requirements it allows the operator to control accurately the total air at all times.

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Varied construction boosts demand for

Lighter prestressed shapes

The first two beds of Perma-Stress, Inc., Holly Hill, Fla., were these double-tee units. The one at left has a 398-foot working length and a dead end consisting of a concrete-filled steel-box column with holes to allow for variations in the stressing pattern. The other bed has concrete abutments holding tie bars attached to the strand template on the opposite side of the anchorage.

Contractors and Engineers staff article

Increased construction activity at commercial plants, motels, schools and restaurants around the Daytona Beach, Fla., area has made it profitable for Perma-Stress, Inc., Holly Hill, Fla., to continually expand its prestressed-concrete plant since starting operations in 1955. The company turns out a variety of items —ranging from double tees to flat slabs—for this type of construction.

Perma-Stress set up its first prestressed bed—a single double-tee with an effective working length of 410 feet—in 1955. Since then, a second double-tee bed, 398 feet long, has been added, together with a 100-foot-long specialty bed to handle piling, beams, or junior joists.

Other additions include a 200-foot lintel bed and two 200-foot flat beds. Two more flat beds will be built in the near future to meet the demand for this prestressed component. Each of the beds will be 200 feet long and will be capable of prestressing tongue-and-groove flat slabs 4 feet wide and 4 inches deep.

The 410-foot double-tee bed has concrete supports for the steel forms, which are capable of forming units with a 12-inch stem and 2-inch deck —an over-all depth of 14 inches. This bed has two 1¼-inch-diameter steam lines inside the concrete supports used to cure the concrete. This feature has presented some problems whenever there has been a break in the steam lines.

This trouble has been overcome on the second double-tee bed, which is equipped with four 1-inch steam lines, by enclosing the double-tee form with tectum insulation panels. These are easily removed when any break in the lines has to be repaired. The steel form, capable of making double tees with 8-inch stems and 2-inch decks, for an over-all depth of 10 inches, is supported on a steel frame bolted to the casting-bed slab. Steam is also supplied to the lintel bed by a pipeline.

Strand rack

Perma-Stress has a 2-reel strand rack located between the pair of double-tee beds and the line formed by the lintel and specialty beds. An additional strand rack will be added after a second pair of flat beds is built. Two sizes of cable, 7/16 and ⅜ inch in diameter, are used, to prestress the different components. A pickup truck generally pulls the strands from the live end of the casting bed to the dead end. A Rodgers 150-ton hydraulic jack is used to stress the strands for the double tees. The strands are tied to a wheel-mounted strand plate by vises and are elongated by jacking against the anchorage column. Four 1½-inch-diameter tie bars connect the push block to the strand plate. Elongation for the 398-foot-bed strands is about 30 inches, for those of the 410-foot bed, 31 inches.

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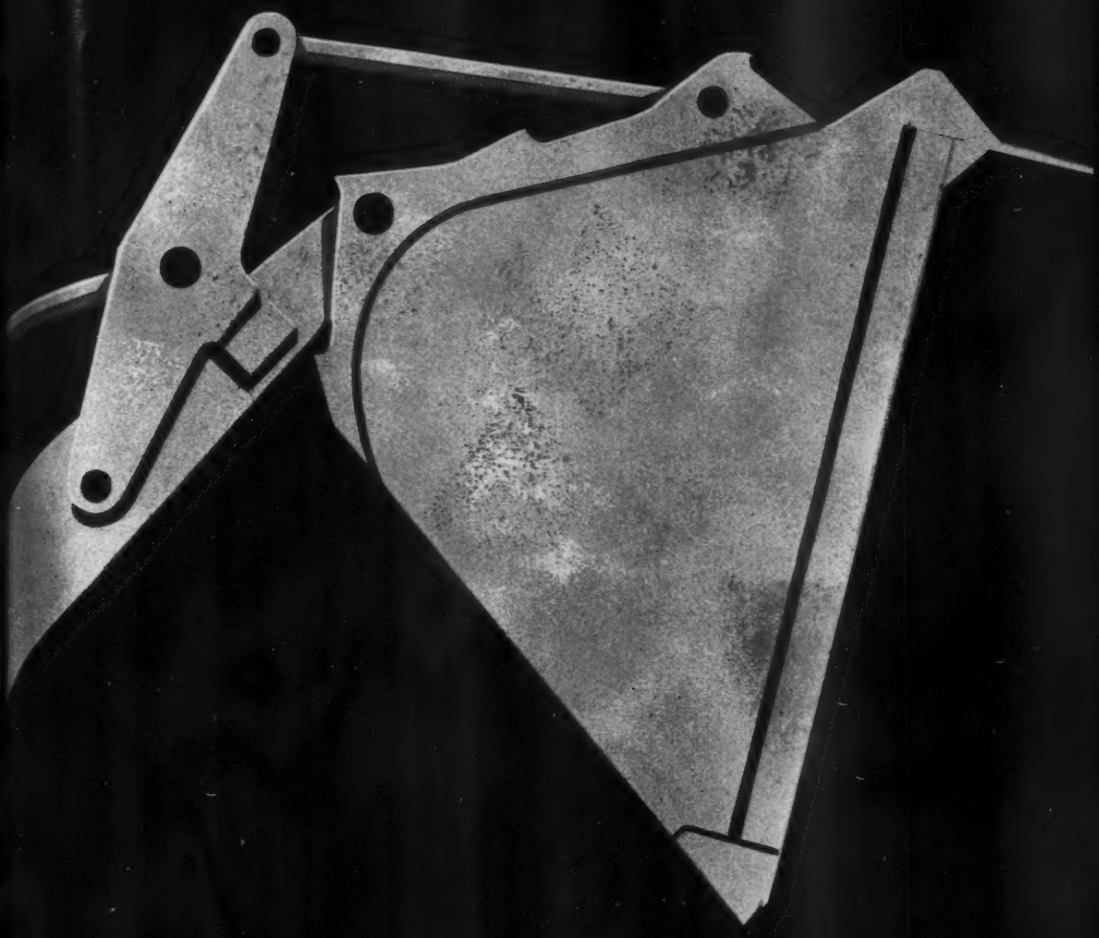

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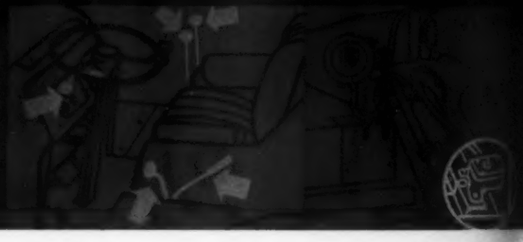
THE NEW 922...1 1/4 YD.,



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THE 922 TRAXCAVATOR—1¼ CU. YD. BUCKET

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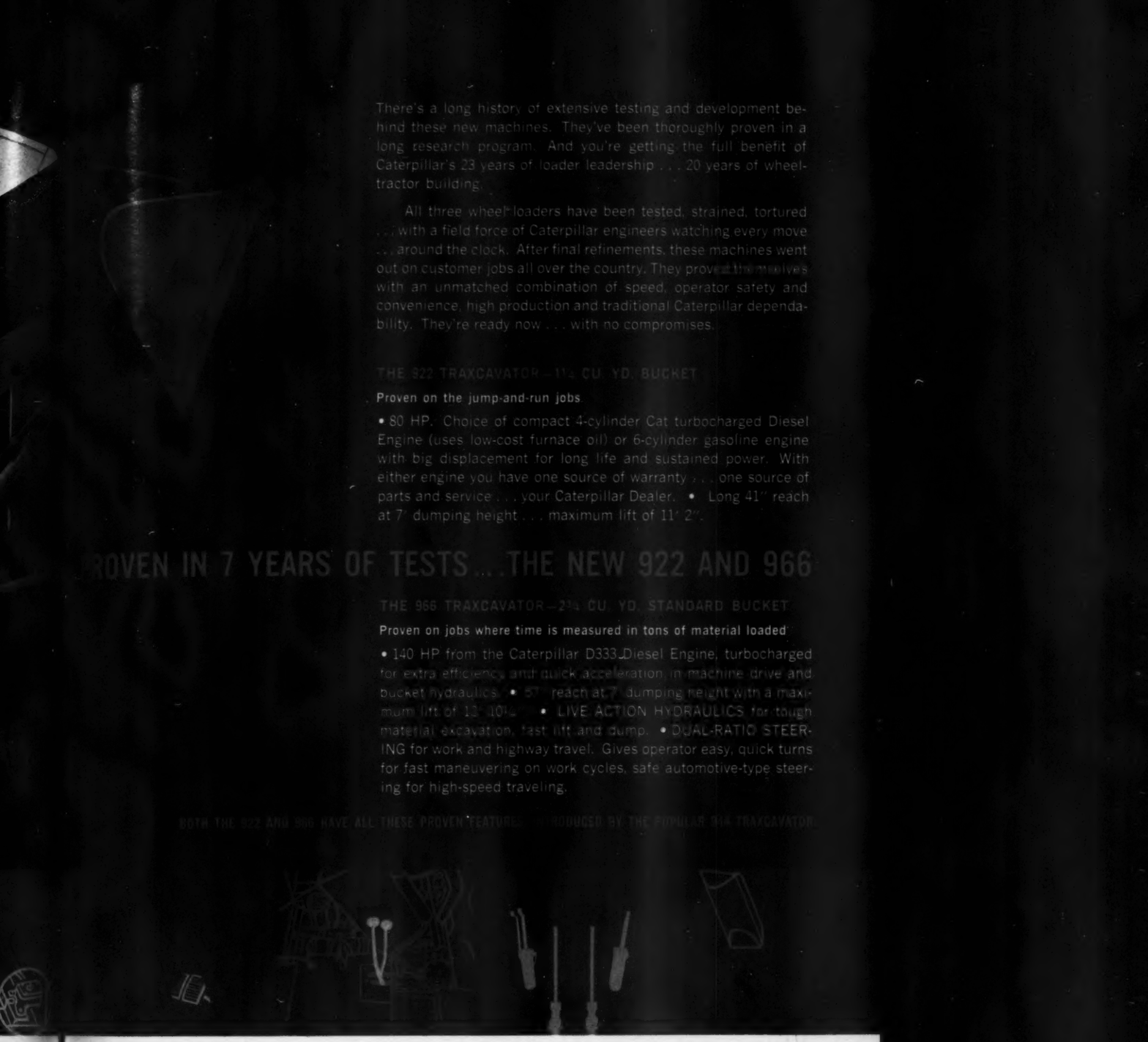
• 80 HP. Choice of compact 4-cylinder Cat turbocharged Diesel Engine (uses low-cost furnace oil) or 6-cylinder gasoline engine with big displacement for long life and sustained power. With either engine you have one source of warranty . . . one source of parts and service . . . your Caterpillar Dealer. • Long 41" reach at 7' dumping height . . . maximum lift of 11' 2".

THE 966 TRAXCAVATOR—2¾ CU. YD. STANDARD BUCKET

Proven on jobs where time is measured in tons of material loaded

• 140 HP from the Caterpillar D333 Diesel Engine, turbocharged for extra efficiency and quick acceleration in machine drive and bucket hydraulics. • 57" reach at 7' dumping height with a maximum lift of 13' 10½". • LIVE ACTION HYDRAULICS for tough material excavation, fast lift and dump. • DUAL-RATIO STEERING for work and highway travel. Gives operator easy, quick turns for fast maneuvering on work cycles, safe automotive-type steering for high-speed traveling.

BOTH THE 922 AND 966 HAVE ALL THESE PROVEN FEATURES . . . INTRODUCED BY THE POPULAR 944 TRAXCAVATOR



Positioner. lift lever is The bucket height and hold posi- ile lowering on the tilt positions

Dual Brakes. The left brake neutralizes the transmission as it stops the machine. This transfers extra power to the bucket . . . assuring full loads even in tough material. The right brake stops the machine with the transmission engaged . . . giving full machine control.

Easy Service Access. The seat tips forward for easy access to transmission oil filter and control linkage adjustments. Unit construction allows independent removal of engine, transmission, other major components. The dry-type air cleaner can be serviced in about 5 minutes.

Live Action Hydraulic System. Plenty of power from the engine is always available to the hydraulic system for fast bucket action. Control valves are enclosed in the steel reservoir for complete protection. The Caterpillar Live Action Hydraulic System is full-flow filtered for trouble-free operation.

Available with a Complete Line of Attachments. There are special buckets for light or heavy materials, forks and the exclusive Side Dump Bucket that cuts maneuvering time and space because it dumps to the left as well as forward. A fiber-glass cab is also available.

● Herff and Fred Harris, owners of the Harris Sand Pit, Von Ormy, Texas, bought a 944 in April and another in June. The first machine was put to work 12 hours a day, 6 days a week. In June its service meter read 740 hours. "We haven't had a minute's down time," said Herff Harris. "This machine's been working! We like everything about it and especially the basic design that gets the lift arms out of the operators' hair. We figure the speed of the machine plus the automatic bucket positioners give us at least 25% more production than other machines of the same size."

FROM THE FIELD:

HERE'S WHY THE 944 HAS GAINED ACCEPTANCE UNMATCHED IN MACHINE HISTORY

● At the Clarksville Stone Co. near Clarksville, Tenn., Charles Day speaks his views of their 944: "I believe this new Traxcavator is the best machine in its class and for several reasons. One is that open, clean deck; our operators are on and off the machine a good deal and on the 944 they can just walk up, sit down and go to work. And I've noticed the stability of the machine is better than the rest; the 944 doesn't tip—it stays on the ground. I've heard our operators talk enthusiastically about the easy controls and especially the automatic bucket positioners. Our best operators are better on the 944."

If there's a 944 operating in your area, chances are you'll get this kind of impressive report from owner and operator. But for the whole story on all 3 wheel loaders, there's only one man to see—YOUR CATERPILLAR DEALER. His staff of materials handling experts and heavy equipment specialists has the full story on the wheel loader line that's brand new with features, but 7 years old with experience. Ask for a demonstration on your job ... see how these wheel Traxcavators make other loaders obsolete.

Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

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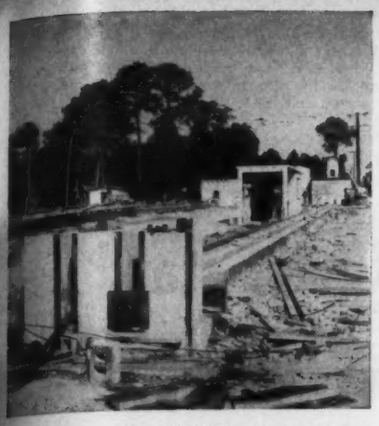
ADVANCED AS TOMORROW
CERTAIN AS YESTERDAY



Since 1955, a variety of beds has been installed to fill the increased demand for commercial building components. This is the dead end of the 200-foot lintel bed, which has two casting lines.

The 108-foot-long specialty bed produces piles, junior joists, and beams. The variety of components is achieved by changing the pallet lining inside the steel side forms that are shown lying along the edge of the bed.

The 200-foot flat beds are in use to turn out 4-foot-wide × 4-inch-thick tongue-and-groove roof panels. Two 200-foot beds will soon be built to meet increased demand for the units.

The double-tee strands are simultaneously subjected to an initial load of 500 pounds to remove any kinks or irregularities in the cable. The stressing load, as measured by the strand elongation, is then applied from this starting point. A load of 18,900 pounds is applied to each 7/16-inch-diameter strand; a load of 14,000 pounds is applied to the ⅜-inch cable. The Rodgers hydraulic pump powering the jack is located inside the pump house beyond the live end of the double-tee beds. The strands on all other beds are stressed individually by 30-ton jacks.

High-early 6,000-pound concrete is used during the week to permit detensioning and removal of the components the following morning. The operations are set up to allow for pulling the prestressed components and resetting the forms during the morning hours and placing the ready-mix concrete during the afternoon. During the height of the summer months, wet burlap is placed over the freshly placed components to prevent surface cracks due to excessive shrinkage.

Strands for one of the double-tee beds are fastened to a strand template in front of the anchor column. The Rodgers 150-ton hydraulic jack acts against the push plate.

Steam curing

The steam, manufactured by a 200-hp boiler, is turned on immediately after concrete is placed and is kept on throughout the night. It is shut off at the start of operations the following morning, when the components are ready to be detensioned.

Detensioning is accomplished by simply burning the strands between the bulkheads with a torch. This is done without replacing the jacks and reversing the jacking operations to allow the stressing load in the cables to prestress the components. The load is immediately transferred to the concrete as cables are burned.

Perma-Stress uses Hyster and Clark fork-lifts with 30-foot spreader beams to pull the prestressed sections from the casting beds and stockpile them in the yard. The steel forms, liners, and pallets were fabricated by Plant City Steel Corp. and Food Machinery & Chemical Corp.

Perma-Stress is affiliated with Dura-Stress, Inc., Leesburg, Fla., which produces such heavier prestressed-concrete sections as bridge girders.

J. Ashton Gray is the secretary and treasurer of Perma-Stress and Dura-Stress. Max Cleland is the vice president and general manager of Perma-Stress; Charles Baker is the engineer.

THE END

A WILLIAMS DIGGER
FOR EVERY PURPOSE!
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Available in twelve models and a wide range of hole diameters from 12 to 96 inches and depths to 110 feet. Whether truck, tractor or specially-mounted the Williams Diggers will serve any purpose and, in this respect, are virtually custom rigs for the earth-boring contractor. Williams Diggers are unexcelled for sinking holes for everything from electric line poles to architectural foundation piers.
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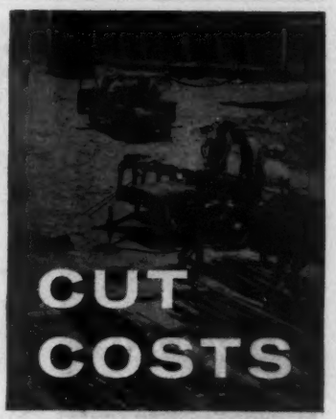

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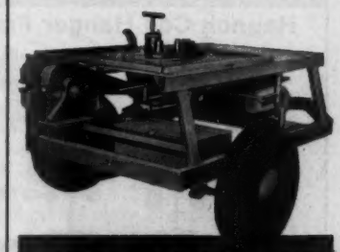


MIDLAND PRODUCTS CO.
MAHWAH, NEW JERSEY

For more facts, circle No. 299

Up to 25,000 blows were required to drive prestressed-concrete piles 180 feet to bearing on coral and sand for the Ala Moana office building in Honolulu. Piles showed no damage, even though more than 1,000 blows per foot were sometimes needed. Piles were prestressed in 60-foot lengths in a semiportable plant on the site. In the background a pile is being tested with a load of 500 tons.

Prestressed piles stand unusually hard driving

Contractors and Engineers staff article

Punching through ledges of hard coral interspersed with soft strata, the prestressed-concrete piles for the Ala Moana Center office building in Honolulu withstood as many as 25,000 blows of a heavy hammer to attain suitable bearing on hard coral and sand 180 feet below the surface.

Although it sometimes took 1,000 or more blows per foot to penetrate the shallow layers of hard coral, the tough prestressed piles showed no damage. The piles were cast in 60-foot lengths in a semiportable plant temporarily located on the job site and were spliced as they were driven.

A test pile was loaded to 500 tons without damage. During the application of the load, the top of the pile settled about 1½ inches; when the load was removed, it regained all but ¼ inch of this settlement. This seemed conclusive proof that the pile was actually in point bearing and that the apparent settlement was actually due to the compression of the long, slender pile. The test gave assurance that the 200-ton design load was well on the safe side.

Unit of Ala Moana Center

The Ala Moana office building, which is also known by its address as 1441 Kapiolani Blvd., is being built by the Hawaiian Land Co., a subsidiary of Hawaiian Dredging & Construction Co., Ltd., as one of the units of the huge Ala Moana Center. The center is located between downtown Honolulu and the Waikiki area, overlooking Ala Moana Park and beach.

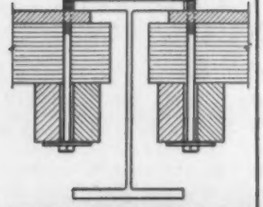
Another unit of the center, a 2-level shopping center, was completed and opened for business last year. This unique structure includes large numbers of prestressed piles, beams, and joists in its main building and the surrounding 2-level parking area.

The 25-story office building has an unusually high first floor and mezzanine designed to house a bank. The twenty floors above the bank are typical office floors, while the top

SUPERIOR HANGERS...
Designed for Fast Erection and Easy Stripping

FOR STEEL BEAMS AND CONCRETE GIRDERS

ADJUSTS FROM TOP OF DECK



NEW Pres-Steel Hanger
(Pat. pending)

This newly developed Pres-Steel Hanger combines the desirable features of conventional hangers, yet costs less! Assembly is simple, ½" Coil Bolts are passed up through the hanger—no threading is necessary—and a square coil nut is applied. All adjustment is made conveniently from the top of the deck. The foot of the hanger has a saw tooth edge which bites into the flange upon application of a load, preventing any movement of the hanger. The flat top provides even bearing for the nut and the bolt hole is so formed that there is no binding of the bolt on removal. Pres-Steel Hangers are also made to take the bolt or coil rod at 45°.

These economical hangers have a safe working load on steel beams of 8,000 lbs. (ultimate capacity 14,500 lbs.). On concrete girders the safe working load is 6,000 lbs. (ultimate capacity 9,000 lbs.).

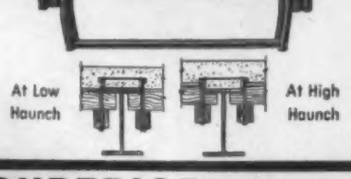
ADJUSTS FROM TOP OF DECK

Prescon Hanger

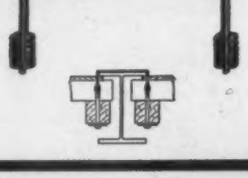
This unique hanger provides hanging points cantilevered away from the concrete girder sides. The forms are hung from coil bolts threaded into heavy square coil nuts bearing on the top plate. Provision is also made for haunch forming above the girder. Adjustment is made conveniently from the TOP of deck. Simultaneous overhanging slab or curb forming is accomplished with coil rod and wing nut at 45°. Available in two types—6M (6,000 lb. safe working load) and 10M (10,000 lb. safe working load). The use of Prescon Hangers on concrete girders eliminates hazardous, makeshift methods.

OTHER SUPERIOR HANGERS FOR HANGING FORMS ON BRIDGE SUPERSTRUCTURES

Haunch Coil Hanger Frame



Coil Beam Saddle



Wire Beam Saddle

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WORKING PARTS Returnable for credit.

For details request New CATALOG 700

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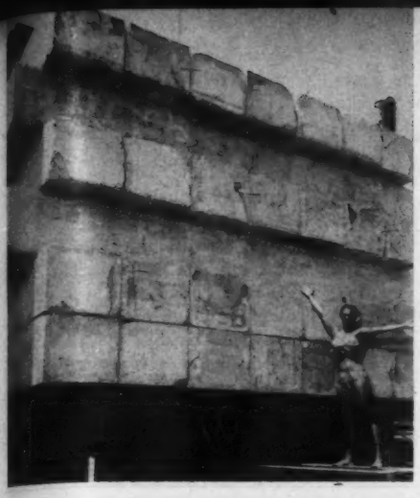

A million pounds of dead load and 120 pounds of "live" load are used to test a pile. The load assures adequacy of a revised design for the foundation. The 16½ and 18-inch octagonal prestressed piles are designed for respective loads of 75 and 125 tons.

Piles are driven to exact alignment and perfect plumb with the aid of this template. The H-pile legs are first driven into the ground and the template is set. Two transits keep the pile plumb during driving. Piles are left sticking 14 to 18 feet out of the ground to serve as columns supporting the second deck.

four floors contain machine rooms, a restaurant, and an observation room. This tower portion of the structure measures 195 × 66 feet.

The bottom of the tower is surrounded by four floors of parking, which occupy an area 328 × 214 feet. Ramps from this parking area cross the adjacent street and connect with the upper parking deck of the shopping center.

Shallow piles not adequate

The piling for the Ala Moana shopping center was driven through some 10 feet of fill and 15 to 20 feet of mud, silt, and other soft material to point bearing on a hard coral ledge that ranges from 2 to 20 feet in thickness. These piles were driven exactly plumb and in precise position with the aid of a template. They were left extending out of the ground to form the columns for the second-floor level.

These are 16½ and 18-inch octagonal prestressed-concrete piles designed for bearing loads of 75 and 125 tons, respectively, and tested to at least double the design load. Spaced at 24-foot centers under the buildings and 30-foot centers under the parking areas, they serve these low structures well.

The office building was originally designed to bear on this same coral ledge on some 900 of the 18-inch prestressed piles. But by the time about 100 of these piles had been driven, they began to punch through the coral ledge before meeting the required 15 blows per inch with a Vulcan O hammer.

At this point, work was stopped, and a soil mechanics consultant, Dames & Moore of San Francisco, was called in for advice. A series of borings on the site revealed that there were relatively soft coral and other materials under the hard ledge, with a few intervening hard ledges down to a depth of about 180 feet. Below this depth, there appeared to be a deep strata of hard cemented coral and sand.

A number of alternate foundations were considered, and several of these plans were designed and estimated for comparison. The conclusion was to drive a smaller number of piles to refusal in the 180-foot stratum and increase the load-bearing value of each from 125 to 200 tons.

This left several questions to be an-

(Continued on next page)

Talbert, model T3D-35-RGH-RA T-1, drop deck trailer featuring USS "T-1" steel construction, hydraulic removable gooseneck*, removable three axle suspension, Talbert removable third axle†, outriggers and Hendrickson tandem.

Talbert engineers have broken the weight barrier in trailer design! This *drop deck* trailer is up to 5,000 lbs. lighter than comparable models offered by competitive manufacturers. The USS "T-1" steel used in this trailer is rated three times as strong as carbon steels ordinarily used. This new high strength steel is available in any of Talbert's full line of custom trailers. ***New! Hydraulic Removable Gooseneck**** Powered by twin hydraulic rams for fast, efficient loading and unloading, Talbert's exclusive gooseneck design uses entire bearing area of tractor tandem to raise and lower deck. Simplified, one man control adjusts deck height to clear obstructions.

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*Pat. Pend. †U.S. 2,760,784 CAN. 565,334

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An architect's rendering of Honolulu's 25-story Ala Moana office building, topped with a circular restaurant, and at left, the Ala Moana shopping center. The tower section of the office building is surrounded by four floors of parking area that ties into the upper-level parking area for the shopping center.

the early days of the project.

The new piles were made in a prestressing plant right on the job site. (See "Prestressing Plant Is Semi-Portable," page 82.) They were cast in approximately 60-foot lengths, which were joined with two field splices during the driving to produce the required 180-foot length. The 18-inch octagonal pile forms were custom-built by Van Bebber, Petaluma, Calif. Two parallel sets of forms were welded down to inserts in the 460 × 12-foot casting bed.

Each line of piles was reinforced with twenty-four ⅜-inch prestressing strands arranged in a circular pattern near the outer face of the pile. The strands were stressed to 14,800 psi before the concrete was placed. Concrete with a compressive strength of 7,500 psi was specified for the piles, but the 28-day test cylinders actually averaged closer to 8,500 psi.

The driving proved as difficult as the test pile had indicated. Several hammers were tried, but the contractor finally adopted the special Raymond hammer that had annoyed so many San Franciscans as it drove piling for the Crown Zellerbach building in the heart of their city. This was a single-acting steam-pow-

(Continued from preceding page)

swered. Would the piles develop the required load-bearing value without undue settlement? Did these long piles have sufficient lateral support? Most important, could they be driven through the hard coral ledges to attain point bearing in the desired stratum?

Drive test pile

One of the 18-inch prestressed piles was driven for test purposes. Using Raymond fixed leads on a Northwest Model 75 crane and a Vulcan O hammer, the contractor hammered the pile down through the first hard ledge, then through softer material to and through the next ledge, and on down to the solid footing.

At times, it took more than 1,000 blows of the heavy hammer to penetrate a foot of coral, but the hammer banged away, and the tough prestressed pile inched on down without damage. When the hard stratum was reached, the pile was seated at a minimum of 40 blows per inch.

Then came the load test.

A million pounds (500 tons) of concrete and steel was carefully loaded onto the 18-inch octagonal pile as instruments recorded every fraction of an inch of settlement and lateral movement. Then, to top it off—for the benefit of the photographers—a 120-pound Tahitian dancer was added to the load.

During the loading, the pile apparently settled about 1½ inches. This, however, was just about the calculated compression of the slender 180-foot column under this huge load. When the load was removed, the pile regained all but ¼ inch of the settlement, proving that the pile was in point bearing on a very substantial stratum and verifying the safety of the 200-ton design load.

The footings were then redesigned. The shallow piles under the parking area and for batter piles on three sides of the tower were retained, but a smaller number of the long piles was used under the tall structure. The number of piles needed was reduced by 317.

While the new piles were being cast, the contractor rigged up an extractor and pulled all of the piles driven in

For more facts, use Request Card at page 18 and circle No. 302 ►

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AMSCO PUMP OPERATES 24 HOURS A DAY...PUMPS DISCHARGE 3 MILES

On the dredge C. H. Cobb, operated by New England Dredge & Dock Co., the Amsco 12" Form 50 S3B pump shown at right is "on duty" 24 hours a day, 6 days a week. It handles 5000 yards a day, pumps discharge over 3 miles with one booster... under 23 railroad tracks, through a mile-long railroad tunnel and through cliffs to a marshland.

Regarding this Amsco pump, installed 2½ years ago, Mr. C. H. Cobb, General Superintendent says—"Its performance and price make this the most desirable pump on the market".

AT STAR ROCK PRODUCTS COMPANY

JAW PLATES REDESIGNED IN AMSCO ALLOY...TONNAGE UPPED 75%

At Star Rock Products Co., Anaheim, California, crusher jaw plates previously used were giving only about 6 months' service. Large rocks dropped into the crusher often caused the jaw plates to "give" enough so the rocks wouldn't crush. Jams and costly delays resulted. Plates would often flow and crack.

Amsco collaborated on a redesign, using 2% chrome (Amsco MY) alloy. After 6 months' service, the plates were in excellent condition. Jams and delays have been eliminated, and tonnage handled *increased 75%*.

AMSCO

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AMERICAN Brake Shoe COMPANY

erul hammer developing 32,500 foot-pounds per blow.

Typical entries in the driving log show 1,000 or more blows per foot in penetrating the hard layers. Most of the piles went down 170 to 180 feet to point bearing on the hard coral. However, one entry shows 1,641 blows with a penetration of just 6 inches at a depth of 137 feet. This pile was finally given 233 blows in the last inch and considered to be in suitable bearing at that depth. The log shows an average of 25,000 blows per pile. The amazing fact is that the pile heads were not damaged by this very hard driving.

Cans make quick splices

The splicing operation was very fast and simple. Holes in the ends of the 60-foot pile sections allowed for the installation of 2-inch steel dowels that penetrated 3 feet into each section.

A 6-foot-long steel sleeve, or can, prefabricated of ¼-inch steel to the exact size and shape of the piles, fitted over the outside to complete the splice. These cans were made to the exact 18-inch design size of the piles. Since the piles were always just a trifle larger, due to the expansion of the form as they were cast, they fitted very tightly.

After the first section of piling was driven down to a few feet above ground level, the steel can was slipped over it and driven 3 feet over the pile. An interior clip stopped it at this point. A half-inch of lead shim was then placed on the head of this pile.

The dowel was placed in the precast hole of the first pile; then the next pile section was guided over the splice can and the dowel lined up with the hole in the tip of the pile. The new pile was seated against the previously driven pile section by dropping it into the splice can. This quick drop usually brought the two pile ends into contact and tightened the splice into a rigid unit. The first few blows on the new section completed the union if the drop didn't quite do the job.

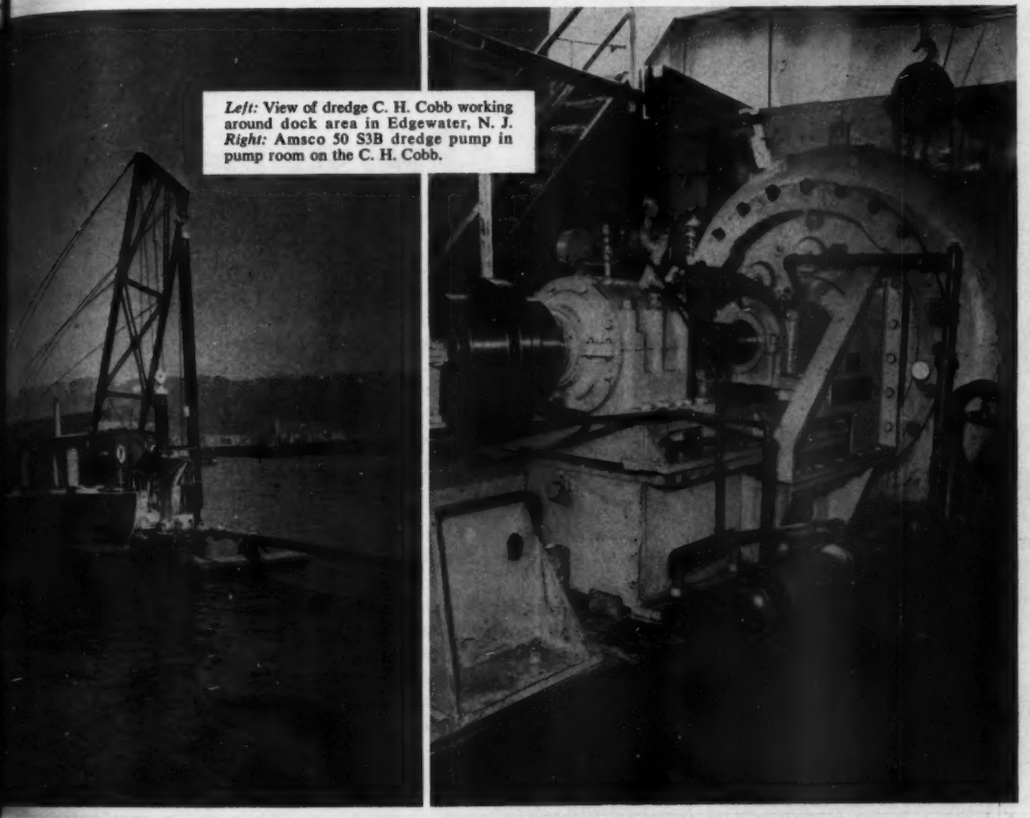
A splice of this kind was easily made in less than half an hour and often much faster.

Reinforced-concrete footings cap the groups of piles to support the heavy building columns. Lateral stability at the ground level is provided by a pattern of grid and diagonal grade beams connecting the column footings.

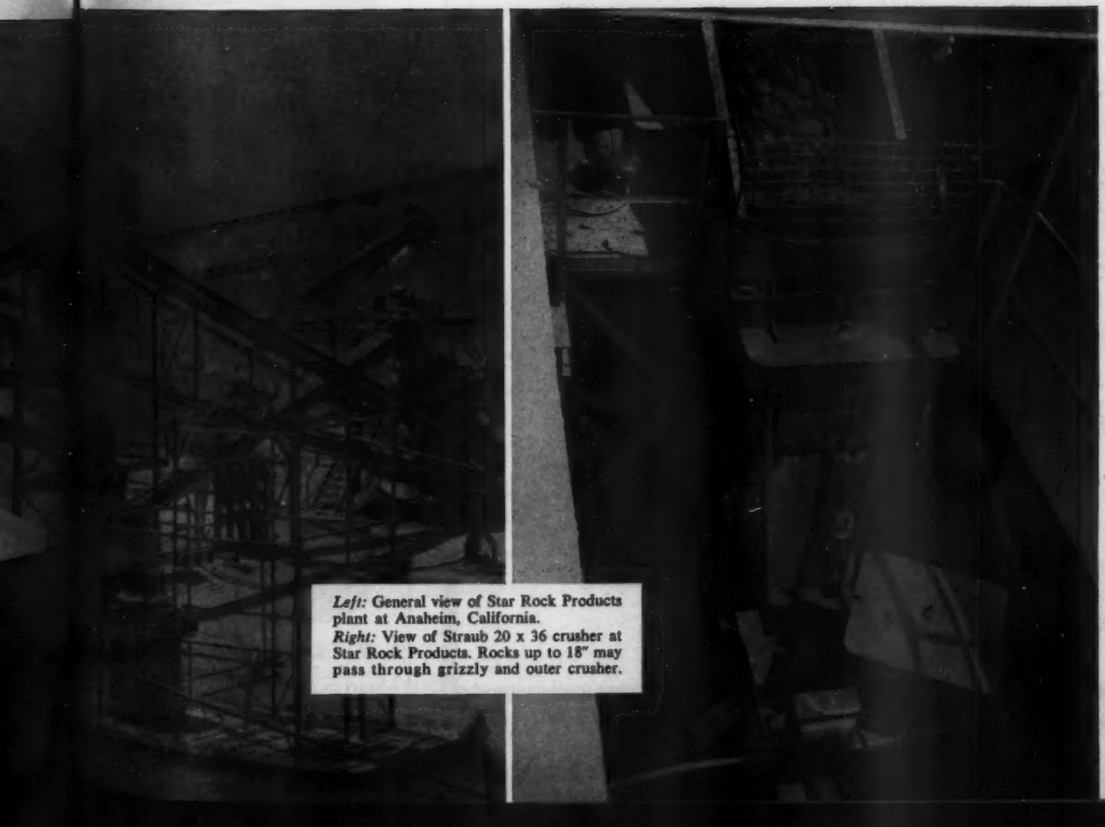
To resist the heavy horizontal component of earthquake stress and the resulting overturning moment, the columns up to the third-floor level have 14-inch rolled-steel centers encased in concrete. The heaviest of these steel columns weighs 426 pounds per foot.

Above the third floor, the columns are of heavily reinforced concrete. Beginning at the third floor, the columns contain No. 18 bars that are butt-welded at the splices. At the higher levels, the reinforcing decreases in size.

The columns and the exterior spandrel beams are cast in place. The intermediate beams and joists are precast, prestressed members set in place in the forms and incorporated with the slab and with succeeding lifts of the columns to form an integral frame. The 4½-inch deck slab, spandrel beams, and sill walls between the exterior columns are cast of lightweight concrete with Vulcanite, a lightweight pumice aggregate. (See "Precast Beams, Joists Cast into Building Frame," page 74, for details of the superstructure construction.)



Left: View of dredge C. H. Cobb working around dock area in Edgewater, N. J. *Right:* Amsco 50 S3B dredge pump in pump room on the C. H. Cobb.



Left: General view of Star Rock Products plant at Anaheim, California. *Right:* View of Straub 20 x 36 crusher at Star Rock Products. Rocks up to 18" may pass through grizzly and outer crusher.

Personnel

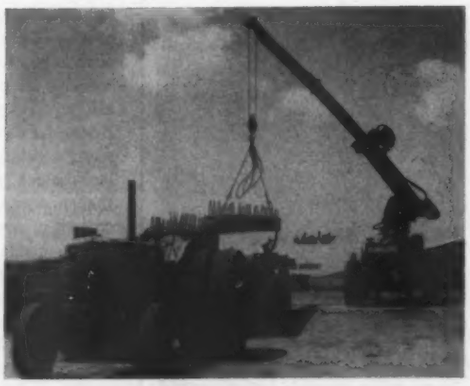
The Ala Moana Center, including the office building, was designed by John Graham & Co., architects, of Seattle, Wash. The firm was represented on the project by Ed Hoehl.

Work was supervised for the Hawaiian Land Co. by project manager C. W. "Chuck" Watson, superintendent Hideo Murata, project engineer Joe Iwamura, and engineer for the prestressed-concrete plant Gordon Scruton. Park & Yee was consultant to the owner and contractor on the prestressing and construction engineering. THE END

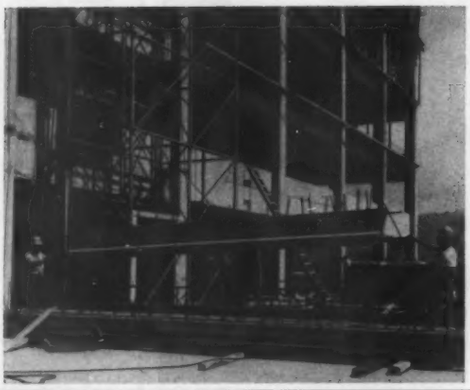
Project manager C. W. "Chuck" Watson supervised the construction of both the Ala Moana shopping center and office building. Watson is also an assistant veep of Hawaiian Dredging & Construction Co., Ltd.

A special boom on a materials tower and two dollies are used to get precast beams and joists into position on the upper floors of the Ala Moana office building in Honolulu. Work is under way on the eighth floor. Note the second-floor parking deck of the shopping center built around the palm tree at left.

PRESTRESSING



Prestressed joists, brought from the casting yard to the fourth-floor level of the parking ramp by a flatbed trailer and old International tractor, are unloaded by an Austin-Western hydraulic crane. It delivers them to the hoist.



These beams delivered to the material tower are made ready for the lift from the fourth to eighth-floor level by the special Chicago boom on the tower. Some 1,325 members were handled in this way.

Precast beams, joist

Contractors and Engineers staff article

How to hoist and place some 1,325 precast, prestressed beams and joists weighing up to 6,500 pounds each without the use of a crane was one of the problems faced by the Hawaiian Land Co. in the construction of the Ala Moana Center office building in Honolulu. (For details on the building foundation see "Prestressed Piles Stand Unusually Hard Driving," page 70.)

The solution to the problem of handling the heavy units was found in a special boom mounted on the materials tower and in a pair of ingenious dollies fitted with hand-powered lifting hoists and large rubber-shod wheels.

The modified Chicago boom of the tower picks up the beams and joists, delivered by a trailer to the fourth-floor parking-ramp level, and raises them to the higher floors of the 25-story structure. On successive floors, the workmen roll the prestressed sections into place on the dollies and then jack them up into position in the forms.

When the 4½-inch concrete deck is cast, it ties the units into a continuous frame; the slab serves as the top flange of I or tee-beams, and the prestressed girders and joists make up the stems.

Re-use plywood forms many times

The heavily reinforced rectangular concrete columns of the structure are

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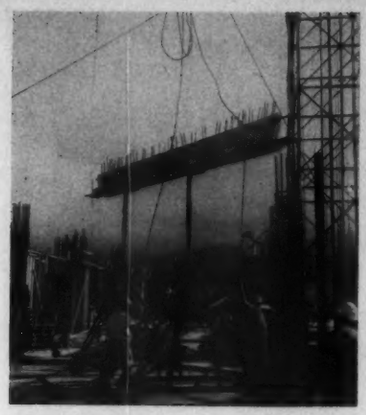
special boom erected on the tower has bracing to enable it to handle the beams joists and to distribute the load. Some of lifts went to 6,500 pounds.



The beam is delivered to two dollies riding on large rubber-tire casters, and hoisting lines are slacked off. Pipes supporting the beam telescope inside the pipe sleeves.

One end of the beam goes into forms at right; the other end goes into place on the column capital. The beam is lowered by hand-operated winches. Each works on a cable that runs through a sheave at the bottom of the pipe.

joist into building frame

cast in place in plywood forms tied with external steel clamps. Special capital forms at the tops of the columns flare out in two directions to receive the ends of the precast, prestressed beams.

The spandrel beams between the columns around the exterior of the building are formed with plywood and lumber forms, shored with timber tees and Acrow adjustable steel shores, and cast in place. The elevator wells, designed to take six elevators, are also formed with plywood and lumber and tied with snap ties.

The contractor is building the entire 25-story structure with a single set of forms. As the forms are stripped from one floor, they are

(*Continued on next page*)

Griphoist winches are operated to lower the beam. Then adjustable steel shores will be set under each end of the beam to help support its weight and provide for setting to exact grade. Forming is in place for the exterior spandrel beams.

The dollies are used to set a prestressed joist into a recess in the marginal beam form, left, and on the lower flange of the inverted tee beam, right. Angles bolted to the joist carry the 4 × 6 form joists supporting the deck form.

U.S. Corps of Engineers Approves Permagile for Epoxy Grout and Binder

Wide use forecast for repairing and resurfacing of concrete by federal, state and municipal agencies.

WOODSIDE, N. Y. – Permagile Corporation of America has been approved by the U. S. Corps of Engineers as a source of supply for two, new specifications materials—an epoxy grout and binder.

Both specifications have been developed and established by the Corps of Engineers. Both are intended for new construction and repair of concrete structures involving Corps of Engineers activities with many federal agencies. Additional markets are anticipated from state and municipal agencies and the private construction industry.

Private contractors working on federal projects will be required to use both products in the course of concrete work.

The epoxy grout is intended for use as a bonding agent, for anchoring dowel pins and for filling and grouting cracks.

The epoxy binder is intended for mortar preparations to repair spalls and other defects for leveling and for resurfacing.

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Mr. Lawrence R. Place is Project Foreman for Don R. Fruchey, Inc., Fort Wayne, Indiana, who do steel erecting, machinery moving, rigging and plant work.

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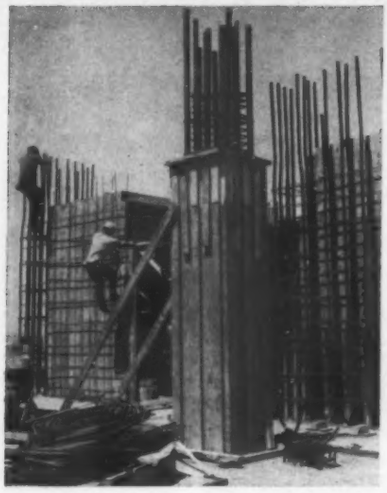

◄ Men assemble plywood column forms and the forms for the elevator wells. A single set of forms was used for the entire 25 floors. Note how the columns are heavily reinforced even at this ninth-floor level.

Inverted tee-beams are shored up with Acrow adjustable steel shores. A line of the beams shows at upper right. Precast, prestressed-concrete joists are then set in place on the flanges of the tee-beams and shored enough to control the camber. Timber form joists, resting on angles bolted to the precast joists, support the steel floor panels. ►

For more facts on Gulf spread on insert, use Request Card at page 18 and circle No. 310

the prestressed members into the cast-in-place deck slab, stirrup bars are left projecting from the top surfaces of the beams and joists. These bars are bent down into the slab after the precast members are placed.

To produce these prestressed members, as well as the piling for the building foundation and all of the prestressed members for the adjacent shopping-center building, the contractor set up a semiportable prestressing plant on the job site. (See "Prestressing Plant Is Semiportable," page 82.) All of the prestressed members for the office buildings were cast and stockpiled on the site before work started.

Tower hoist raises beams

Stockpiled sections are loaded by an Austin-Western hydraulic crane onto a 4-wheel trailer pulled by an International rubber-tire industrial tractor. This rig comes up the ramp of the parking section of the building to the fourth-floor level. Sections are stockpiled within reach of the Chicago boom.

Although the contractor did not want to tie up a crane on the job, these precast units weighed considerably more than could usually be handled by a Chicago boom on a materials tower. A special boom was designed, together with a modified attachment to the American Tubular Scaffolding double hoisting tower and some additional bracing to distribute the load on the tower.

Before any of the units were actually raised, the device was thoroughly tested; it picked up one of the heaviest sections, weighing 6,500 pounds, and tried to work in all possible situations, such as fast starts, quick stops, swinging, etc. The tower

(*Continued from preceding page*)

hoisted up the stair-well openings to the next floor to be reset. Some repair and replacement is necessary, but the forms actually deliver up to 25 re-uses.

Precast framing

The beams spanning between the columns (except for the exterior spandrel beams) and the joists that span from beam to beam are all precast, prestressed members.

The beams, which span up to 32 feet, are inverted tee sections. The bottom flanges are 16½ inches wide, while the stem is 5½ inches wide. The beam depths are 20 or 24 inches, depending on the span. The reinforcing consists of between 10 and 29 pretensioned ⅜-inch prestressing strands.

The joists, which span up to 30 feet, are simple rectangular sections measuring 6 × 18 or 8 × 14 inches. They are reinforced with nine of the ⅜-inch pretensioned strands. To tie

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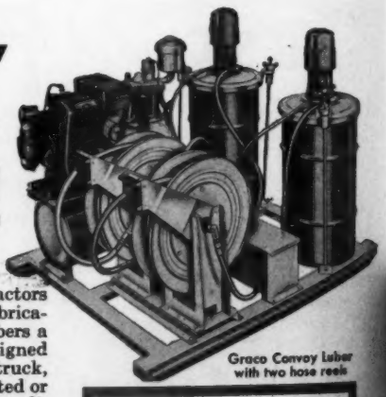
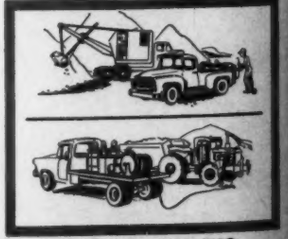


Graco Convoy Lubers with two hose reels



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Left to right: J. R. Riggs, General Superintendent, with Joe Metz, Gulf Sales Engineer, and E. E. Snyder, Project Manager. On-the-job engineering service is one of the plus values you get when you deal with Gulf.

On the Niagara Power Project . . . 2 million cubic yards of

GULF MAKES THINGS

The Niagara Power Project is the largest hydro-electric development in the Western World. Once completed, it will generate 2,190,000 kilowatts of electricity. Some 39 million cubic yards of rock will be excavated to prepare intake channels and foundations for two dams.

A vital part of this tremendous project is the 40-million dollar Tuscarora Pumping-Generating Plant. It's being constructed by the joint Tuscarora Contractors: Arundel Corp., L. E. Dixon Co., and the Hunkin-Conkey Co. Project Manager: E. E. Snyder. And behind him, 1,300 rugged crewmen and over two million dollars in construction equipment. Digging began on December 1, 1958. In one six-month period, this crew moved 1,300,000 cubic yards of rock—more than 1,000 cubic yards an hour.

Working with Tuscarora Contractors, Gulf engineers set up a preventive maintenance program that required only seven lubricants for all equipment. These multi-purpose lubricants keep the program simple and effective—all have built-in safety factors. And the program is economical. There are less products to buy. Ship. Store.

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Rip, tear and tug. Gulf lubes and greases help heavy duty construction equipment set the pace. No equipment has failed because of faulty lubrication.

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rock moved, and not one transmission failure . . .

RUN BETTER!

Del Lundmark, Equipment Superintendent, says, "We're the only contractor on this project who hasn't lost at least one transmission—and we've moved 2 million cubic yards of rock. I feel that the hydraulic fluid we use—Gulf® Dieselube H.D.—deserves much of the credit." Lastly, Del says, "None of our equipment has failed from faulty lubrication. And we've used over a million gallons of Gulf® diesel fuel, and a quarter-million gallons each of Good Gulf® Gasoline, Gulf Super-Duty® motor oil and other Gulf® lubes."

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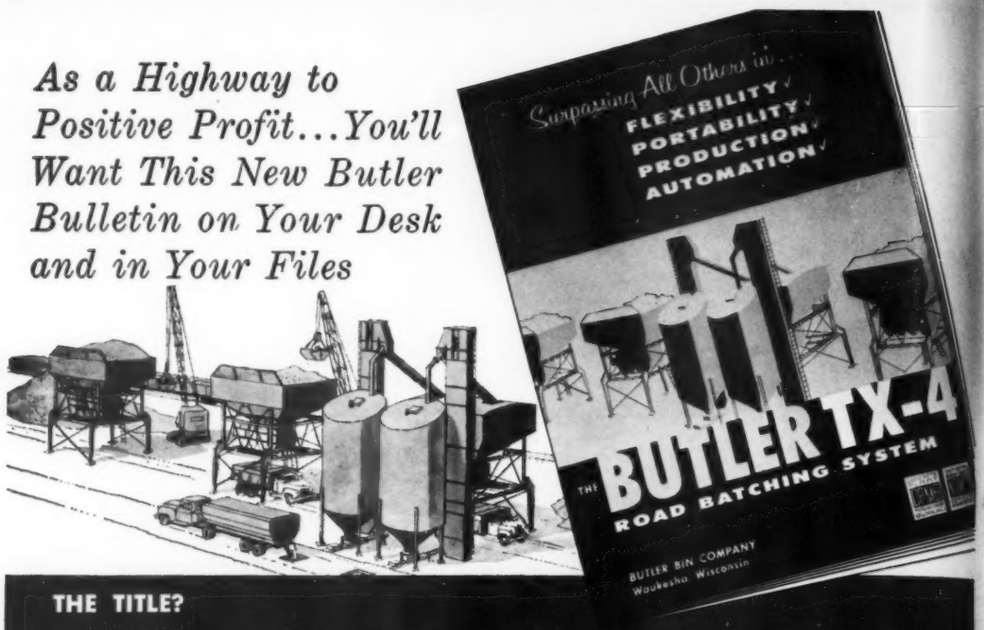

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Deck concrete is placed with buggies. The lightweight concrete is carefully vibrated into place for the heavily reinforced deck. In the background are two Whiteman power trowels used to finish floors. A complete floor was formed and cast every 11 days.

and hoisting equipment showed no evidence of strain. This tower eventually reached a height of 350 feet above the ground to serve the roof level, 300 feet above the ground.

The hoist lowers the beams into saddles on the two dollies on a floor under construction. Each of these dollies consists of a telescoping pipe frame mounted on a steel base fitted with three 18-inch wheels with solid rubber tires. With the telescoping section lowered, the dollies stand about 6 feet high. In the extended position, they can raise the beams to a height of 14 feet.

Each dolly is equipped with a hand-operated Griphoist winch to raise and lower the telescoping section. The cable is reeved through a sheave at the bottom of the movable section to provide a 2-part hoisting line.

These dollies roll easily on the smooth, level concrete floors, and a very small crew can wheel the beams into position quickly.

Shores control camber

The crews first set the beams in place in the special capital forms at the tops of the columns. Then the joists are set in place on the lower flanges of the beams. A few Acrow adjustable shores are placed under the beams and joists to hold them at exactly the desired camber.

Unless the camber is controlled in this way, the beams and joists might deflect more than is desirable, since their strength and their resistance to bending is considerably less before the concrete deck has been cast than it is after the deck has hardened and become an integral part of the composite tee or I-beam section.

Only these few shores, however, are required for the complete deck form; the floor remains uncluttered and easily accessible throughout.

Forms hang from joists

Before the joists are erected, 3 × 3 steel angles are bolted to each side through holes cast into the joists. These angles support the ends of 4 × 6 timber form joists that span between the prestressed joists. Steel decking panels, built especially for the Ala Moana job, are laid in place on the 4 × 6 joists to form the deck. These panels are about 1 foot wide and 5 feet long, with flanges about 2 inches high. Wood wedges bring them to exact grade and also provide the tolerance required for stripping. These heavy-gage steel panels were re-used 50 or more times on the shopping center and apparently can be re-used almost indefinitely.

When the deck form is in place, the reinforcing steel is set in the conventional manner. A large amount of steel in the slab over the ends of the prestressed beams and joists helps develop the negative moment at these points, making the entire structure act as a continuous frame.

Concrete placement

Concrete is delivered in transit mixers, hoisted in the 1¼-yard bucket of the tower, and dumped into a deck hopper. Buggies are filled from the hopper and wheeled to the forms. The floor slabs and spandrel beams are cast of lightweight concrete made with Vulcanite, a pumice aggregate. The mix weighs about 115 pounds per cubic foot. Floor surfaces are finished with Whiteman power trowels.

The crew completes the forming and casting of a complete floor about every 11 days.

Contractor is owner

The Hawaiian Land Co., general contractor for the Ala Moana Center buildings, is a subsidiary of the Hawaiian Dredging & Construction Co., Ltd., the largest construction firm in the fiftieth state. Hawaiian Land Co. will also own and operate the facilities. Financing was provided by the Equitable Life Assurance Co.

Architects for the center are John Graham & Co., Seattle and New York. Park & Yee, structural engineers, Honolulu, served as consultants to the contractor on the prestressing and other construction engineering details. C. W. "Chuck" Watson, project manager for the contractor is also an assistant vice president of Hawaiian Dredging & Construction Co., Ltd. THE END

Engineering firm moves

■ Samborn, Steketee, Otis & Evans, engineering and architectural firm of Toledo, Ohio, has moved its offices from the Toledo Terminal Railroad building to the Libbey-Owens-Ford Building in the downtown section of the city. The firm was founded in 1948, as A. H. Samborn & Associates.

HOW TO RUB or GRIND CONCRETE

Today, more and more builders specify a fine finish for concrete walls and ceilings. Because of this new requirement, and of the time and expense involved for hand finishing large areas, Stow Manufacturing Company has developed two easily portable flexible shaft grinders for finishing concrete. These grinders are electrically powered.

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Either of Stow's portable, electric grinders, the ½ HP model G40-C or the ¾ HP model JT-50, can be used for wet or dry grinding. Both models are available with open or totally enclosed motors, and are equipped with 8 or 12-ft. flexible shafts. Angle heads with different speed ratios can be selected. Write for STOW's pamphlet, Grinding Concrete, for complete information on proper speeds, grinding discs and wheels for both wet and dry concrete finishing. Stow Manufacturing Co., Binghamton, N. Y. also makes a complete line of concrete vibrators, rotary trowels, and screeds.

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plant is semiportable

Four pretensioning beds at site must be moved when job is done

Contractors and Engineers staff article

A portable prestressing plant seems a bit fantastic. Yet the plant producing more than 12,695 pieces of precast, prestressed piles, girders, beams, and joists for the Ala Moana Center buildings in Honolulu is designed to be moved bodily from the site once the job is finished.

The plant consists of four 12-foot-wide pretensioning beds. One bed, 460 feet long, carries two lines of forms for casting prestressed-concrete piles. Two 310-foot beds are used to produce beams and joists. The fourth bed, 280 feet long, produces the heavy girders. Each bed carries two lines of forms welded down to channel inserts cast into the beds. (See "Prestressed Piles Stand Unusually Hard Driving," page 70, and "Precast Beams, Joists Cast into Building Frame," page 74.)

Forms for the girders, beams, and joists were custom made by Food Machinery & Chemical Co., Los Angeles. The pile forms were furnished by Van Bebber Bros., Petaluma, Calif. The plant and the forms were designed by the Ben C. Gerwick Co., San Francisco.

Why portable?

Why a portable plant? There are a number of good reasons.

At the time the job was started, no plant on the islands was set up to produce the volume and variety of units required. The contractor, Hawaiian Land Co., a subsidiary of Hawaiian Dredging & Construction Co., Ltd., decided it would be better to produce the units on the site than to cast them elsewhere and haul them in over the city streets. Land is scarce in Honolulu, and it would not be easy to locate a suitable piece of land off the project site.

Two factors preclude the possibility of leaving the plant on the site. First, the zoning laws prohibit the use of this piece of land for industrial purposes. The plant can be used only as an adjunct to the construction operations. Secondly, the space it occupies will be taken up by buildings of the center when the huge project is completed.

The contractor built the plant on the site, knowing that it must be demolished or moved to another site when the project is finished. While the setup can be called portable only by a rather loose definition of the term, at least it can be easily dismantled for removal when necessary.

Slabs tied down to pile bents

The beds are founded on wood pile bents spaced at 12-foot centers with two piles per bent. Concrete caps, 3 feet square and 12 feet long, were cast over each pair of piles. Heavy anchor bolts were embedded in these caps to tie down the bed slabs.

A bed was cast in increments 12 feet wide, 24 feet long, and 13 inches thick, and each increment was fitted with four recessed lifting eyes. A space of 3 inches was left between the sections when they were cast. After the recessed anchor bolts had been tightened, this space was grouted full. The recesses for the anchor bolts and lifting eyes were also grouted full to produce a smooth finished bed.

At each end of each bed, two 21-inch wide-flange beams were driven for abutments. The beams were driven almost 40 feet, and anchor blocks were cast around them. Since the anchor blocks will have to be demolished, they were cast in two sections to simplify demolition. The beams will be pulled when the bed is moved.

In operation, the ⅜-inch Roebling or Japanese prestressing strand is pulled through the forms, anchored at one end, and stressed to the desired tension with Rodgers hydraulic pumps and jacks. Concrete is placed from transit mixers. The beds are then covered with portable housings while the concrete is cured by steam.

Whether or not the bed is ever picked up and reset at another location, its semiportability will at least save time and labor in the dismantling operation. THE END

The Prestressing section of this issue starts on page 27.

What's it costing you to train new drivers?
$1,000? $1,500? $2,000? These are normal costs for training new operators—except for TORQMATIC DRIVE owners. They report saving up to $2,000 every time they break in a "rookie."
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Look beyond first cost and see the total cost. Then change from clutch-pedal equipment to Allison TORQMATIC. You'll save costly engine-disconnect clutch replacements, too-frequent overhauls of overtaxed engines, repair bills for shock-load-damaged axles and drive lines.
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For more facts, use Request Card on page 18 and circle No. 314

Fullerform franchises on "instant concrete pipe"

■ Fullerform Continuous Pipe Corp., Phoenix, Ariz., is planning to grant exclusive U. S. franchises for the use of equipment to manufacture on-the-job monolithic pipe in continuous pours fed by ready-mix trucks. The company, holder of patents on the Inflaform cast-in-place pipe process, will determine the franchise area size by potential and ability of the franchise holder to cover and service the territory. Licensees will have the right to grant sublicenses and to rent the machinery.

The pipe-building equipment consists mainly of a slidable form that envelops and molds concrete around long, inflatable rubber tubes at a rate of 8 to 12 fpm. The hoselike inner forms, developed by Goodyear Aircraft Corp., create a smooth bore. The process eliminates the need of obtaining manufactured pipe from factories and of freighting short sections to the job site for assembly and hand sealing. Cost savings range from 15 to 30 per cent over the conventional method.

Manufacturing and curing operations are handled in a ditch trenched to size and shape required, and the slip forms follow the grade. A troweling device on the pipe-laying machine creates a Roman arch on top of the finished pipe that provides strength capabilities of more than 11,000 pounds per linear foot.

HRB books on accidents, traffic controls, signs

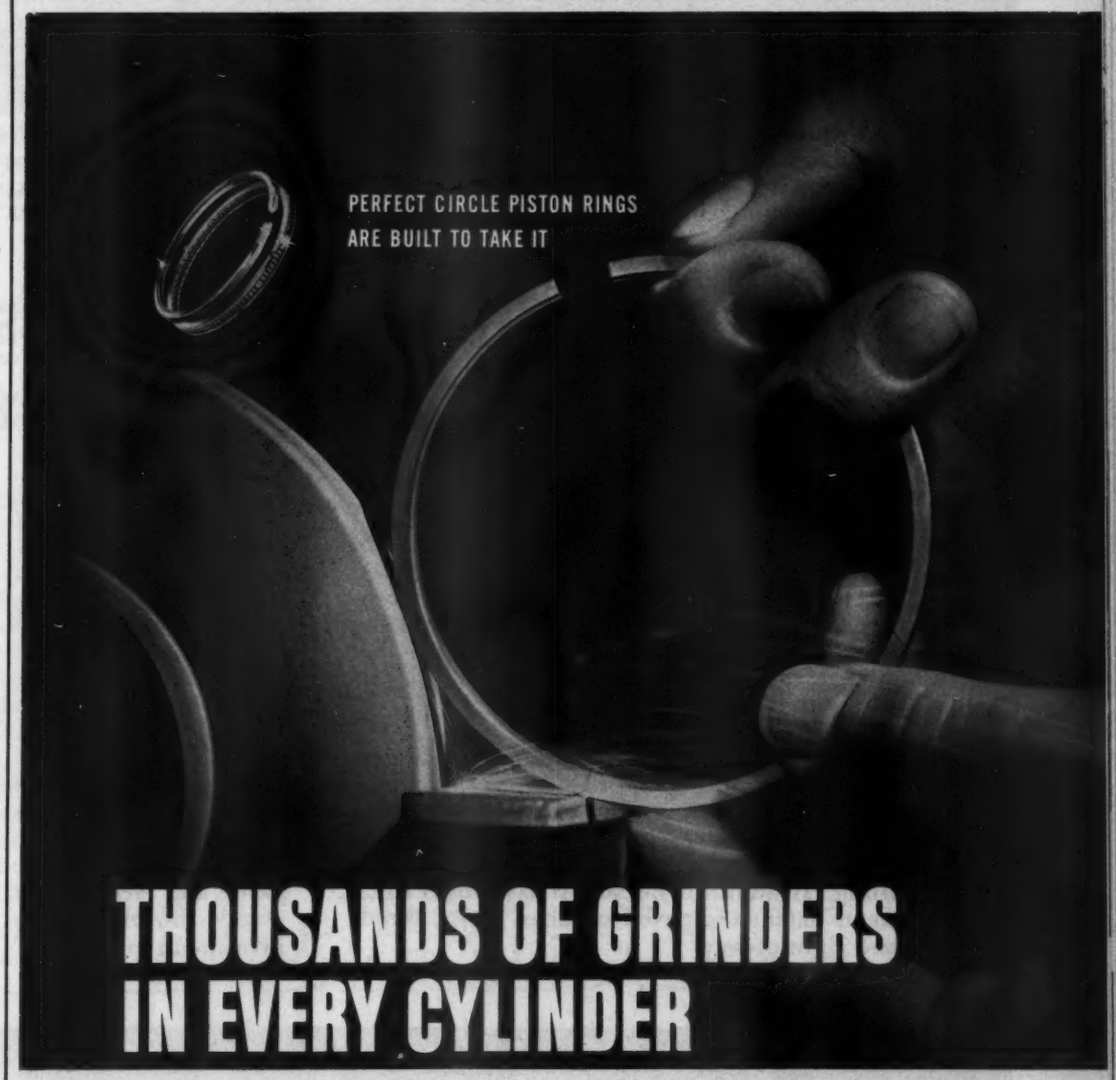
■ Three new bulletins issued by the Highway Research Board are "Highway Accident Studies," "Effects of Traffic Control Devices," and "Sign Supports: Foundation Design."

The first of these contains five papers, covering reports on research in the use of statistics to analyze the difference between the average accident frequency on sections with narrow and wide paved shoulders; factor analysis of roadway and accident data; accident analysis of an urban expressway system; interchange accident exposure; and inventory speed responses and prior traffic records as predictors of subsequent traffic records. Bulletin 240 is priced at $1 per copy.

The bulletin on traffic control devices also contains five papers, on the effect of curb parking on intersection capacity; the effect of edge striping on traffic operations; effectiveness of symbols for lane control signals; some principles of freeway directional signing based on motorists' experiences; and effects of raising speed limits on urban arterial streets. Bulletin 244 is $1.80 per copy.

"Sign Supports: Foundation Design," Bulletin 247, is priced at 80 cents. It deals with foundations to resist tilting moments imposed on upright cantilevers; tests of tilting moment resistance of cylindrical reinforced-concrete foundations for overhead sign supports; and a device for evaluating horizontal soil resistance for overhead sign supports.

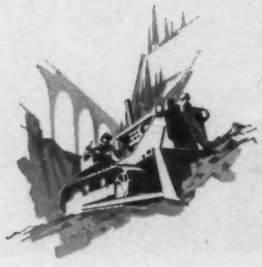
READY TO MOVE OUT in a long load convoy are Lin tee-beams, 120 feet long and weighing 26 tons each, for the 200-mile haul over mountain roads from Phoenix to Fort Huachuca, Ariz., for use in building the Buena Vista school gymnasium. Arizona Prestressed Concrete Co., Phoenix, manufactured the 18 Lin tee-girders. Consultation on their design was handled by T. Y. Lin & Associates of Van Nuys, Calif.



Dirt particles in a cylinder act just like tiny grinding wheels to wear away the face of a piston ring. To protect against this abrasive wear, Perfect Circle 2-in-1 rings are plated with solid chrome—the hardest, longest-wearing surface you can buy.

As a result, wear is reduced an average of 75% over non-plated rings. And, Perfect Circle's chrome plating is 25% thicker than the average of competitive plated rings to provide extra protection and extra life.

In every way, Perfect Circle rings are built to take it. Insist on Perfect Circles—first choice of leading engine manufacturers and mechanics everywhere.



PERFECT CIRCLE

PISTON RINGS • PRECISION CASTINGS • POWER SERVICE PRODUCTS • SPEEDOSTAT
HAGERSTOWN, INDIANA • DON MILLS, ONTARIO, CANADA

For more facts, use Request Card on page 18 and circle No. 315

Drainage Pipe Placement. Superior Side-boom attachment is all-hydraulic-powered assuring precise, safe handling and spotting. Side Boom does not interfere with regular tractor-shovel functions.

Trench Drilling. Side Boom telescopes hydraulically from 10 to 16 feet — spots drills quickly. Backhoe and "4-in-1" Bucket attachments can also be included on the same "PAYLOADER".

Short cuts for water, sewer and pipeline contractors

Contractors faced with keener competition and higher costs are looking for ways to ease the profit squeeze, and public officials, too, are concerned with stretching their tax dollars. They are searching harder than ever for better methods, and for equipment that will do more *kinds* of work — that can move fast from one spot to another so that its versatility can be fully utilized.

That is why "PAYLOADER" tractor-shovels are so widely employed for all types of water, sewage, gas and oil line jobs. A single investment gives you a multi-purpose machine that can handle almost the entire job, including trenching, laying pipe and backfilling. In addition, because it has rubber tires, it prevents damage to paved surfaces, curbs, shoulders and right-of-way.

The fact that a "PAYLOADER" is one of the most mobile of machines is a big factor. The fact that a "PAYLOADER" and only a "PAYLOADER" is available with a Drott 4-in-1 Bucket, a Wain-Roy Backhoe and a Superior Side Boom — any one, or two, or all three at the same time — adds wide versatility to their unusual mobility. It enables them to handle more different jobs on a pipeline project than any other single kind or make of machine.

If you are looking for a way to ease the profit squeeze, we suggest that you talk "PAYLOADER" with your Hough Distributor. He has a wide choice of sizes to meet your needs, plus the most complete parts and service facilities in the rubber-tired tractor-shovel industry to *keep* your "PAYLOADER" investment profitable.

Trenching. "PAYLOADER" with Wain-Roy hydraulic Back-Hoe and Drott "4-in-1" Bucket digs the trenches and backfills for transite water mains in hilly area.

Transporting Pipe. This "PAYLOADER" with "4-in-1" Bucket moves pipe to trench, backfills, grades. "Best equipment we have ever purchased", says owner.

Cross-country Pipelining. Holding 22″ natural gas pipe for tack-welding. Side-boom capacities are available up to 12,000 lbs. at 4 ft. overhang and 6,000 lbs. at 8 ft. overhang.

Padding Trench. Drott "4-in-1" Bucket accurately meters dirt padding into rocky trench bottom for gas distribution line — also lowered-in, backfilled and cleaned-up on this job.

Lowering-In. Installing 8″ gas main along highway. Tires do not injure pavement, traffic is maintained and "PAYLOADER" moves quickly to any part of the job.

Backfilling. (same job as at left.) The user says, "versatility of the 'PAYLOADER' tractor-shovel with Drott '4-in-1' Bucket pays off continuously."

PAYLOADER®

HOUGH®

THE FRANK G. HOUGH CO.
LIBERTYVILLE, ILLINOIS
SUBSIDIARY — INTERNATIONAL HARVESTER COMPANY

Pulling Sheeting. Another "4-in-1" on a sewer job. Pulls piles, loads excess dirt, backfills. "We like the mobility and versatility", says the foreman.

THE FRANK G. HOUGH CO.
762 Sunnyside Ave., Libertyville, Ill.

Send data on all "PAYLOADER" models and attachments.

Name _____

Title _____

Company _____

Street _____

City _____ State _____

9-B-1

For more facts, use coupon or Request Card on page 18 and circle No. 316

The MR-1 prestressed-concrete railroad tie in place. It is ready for installation after 14 hours of curing.

Improved railroad tie is newest prestress item

One of the newest products in the expanding prestressed-concrete manufacturing industry is a railroad tie said to incorporate both production and performance features making it superior to the prevalent timber or other concrete ties.

Drastically reduced curing time, as compared to that of a concrete tie widely used in Europe, is one of the outstanding features of the new tie, according to American Concrete Crosstie Corp., Tampa, Fla., which is mass-producing the new prestressed crosstie with its own patented machine.

Designed by engineers of the Association of American Railroads, the MR-1 tie consists of strong, covered, pretensioned steel strands bonded in a highly compacted, dense, dry concrete mix. It has been extensively tested by the railroads association and recommended over a number of other designs and shapes.

To facilitate mass production of the new tie, the Tampa firm has erected a completely integrated, self-sufficient Watco plant unit around its patented crosstie-producing machine. A custom-size Watco batch bin has been installed over the machine, and steam curing chambers receive the crossties from primary conveyors running the length of the machine area. Production capacity of the plant is approxi-

California paving contractor says:

Liked A-W roller so well, bought two more!

"Our first A-W performed so well that we bought two more over a period of 5 years. We use them to roll both subgrade and finish courses. They are fast and efficient machines; and can deliver the 95% relative compaction required. Torque converter allows more positive control of rollers for uniform compaction. Hydraulic controls make them easy to operate. Plenty of visibility for operators to do precision jobs. The A-W rollers are well-built; maintenance has been no problem."—*Pat Regan, Exec. Vice Pres., A. J. Raisch Paving Co., San Jose, Calif.*

A-W 3-wheel rollers available in 8 to 11, 10 to 12, 12 to 14-ton models; tandems 5 to 8, 8 to 12, 10 to 14 tons. Portable tandem variable between 3½ to 6 tons. Vibratory Roller Compactor and Widener Attachment also available. Choice of gasoline or diesel power; torque converter with 4-speed transmission optional.

Austin-Western offers you a number of important dollar-saving features not available on many other makes of rollers. Let us prove to you the ways in which A-W rollers can increase your compaction efficiency and decrease maintenance and operating costs. Contact your nearby Austin-Western distributor or write directly to us.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

For more facts, use Request Card at page 18 and circle No. 317

FROM 4 TO 22 TONS

Whatever the rig . . .
ONE MAN just drives on to load . . .

with a **MILLER** *Tilt-Top*

"OTS-22"
8' x 4' stationary platform with 8' x 16', or 20' long tilt section available. Gooseneck tongue. Tandem dual wheels suspended directly from tongue frame on new spring beams. 22 ton capacity.

"OTG-15"
Over-the-wheels 8' x 16' 6", or 20 ft. platform available. Gooseneck tongue. Dual wheels mounted on tandem axles with oscillating walking beam suspended directly from tongue frame. 15 ton capacity.

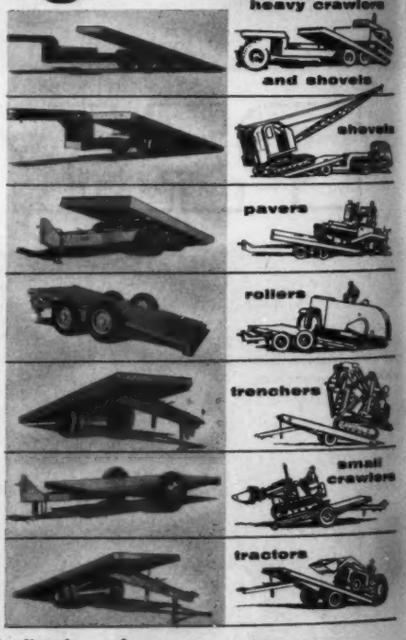
"OT-15"
Over-the wheels, 8' x 16' 6", or 20' platforms available. Eight wheels, dual assemblies, mounted on tandem axles with oscillating walking beam. 15 ton capacity.

"BT-10" & "CT-7"
Extra low, load angle, between-the-wheels platform. 76" wide—either 14' or 16' long. Four single wheels mounted on tandem axles with oscillating walking beam. 10 ton capacity on "BT" . . 7 ton on "CT".

"J-6", "8" & "10"
Heavy duty over-the-wheels models. 8' x 14' platform—16' and 18' platforms available. Single axle, dual wheels. Capacity: "J-6", 6 tons; "J-8", 8 tons; "J-10", 10 tons.

"C-4"
Extra low loading angle, between-the-wheels platform 8' x 14', 16' platform available. Two single wheels mounted on straight-thru H beam axle. 4 ton capacity.

"H-4"
Over-the-wheels, 8' x 14', or 16' platform available. Single straight-thru axle, dual wheels. Completely equipped with heavy duty, first line trailer tires. 4 ton capacity.



Now you can save the extra loading time and extra cost of larger more cumbersome trailers. MILLER Tilt-Tops include a model for almost any rig from large road graders down to the smallest farm type tractor. Now you can reduce labor loading cost to just TWO minutes of ONE man's time. See your distributor now — find out how MILLER's fast, between job loading and hauling can help you save duplicating expensive rigs.

See your MILLER distributor or write for FREE literature to:

Miller Tilt-Top Trailer Inc.
456-P S. 92nd St., Milwaukee 14, Wis.

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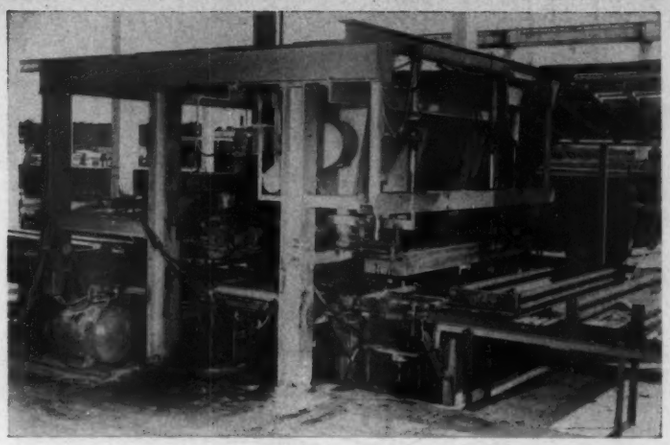


American Concrete Crosstie's patented machine for producing the prestressed railroad tie uses an overhead custom-size batch bin (not shown here). The ties are conveyed to steam curing chambers, so that a long yard curing process is not required.

mately 1,000 units per average day.

A fast production cycle is achieved with the new tie because of the shorter curing time required. It is ready for track installation after only 14 hours of curing, thus eliminating the need for extensive curing and stockpiling yard facilities. The European-made tie mentioned requires a 28-day curing process when produced by the post-tensioning method now employed in its manufacture.

The design of this prestressed tie is said to be such as to eliminate center binding—a common problem with timber and other concrete ties. The center portion of the tie is wedge-shaped on the bottom, so that when the tie is installed this wedge shape pushes the ballast at the center of the tie sideways as the tie becomes depressed in the ballast, thus preventing a center-bound condition from developing.

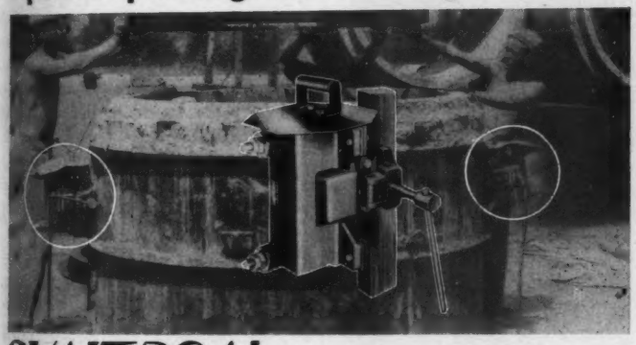
This wedge-shape design permits the tie to sustain much greater loads, and the wider base of the tie allows expansion of the distance between ties from 20 to 30 inches, thus reducing the required number of ties.

Because of timber shortages overseas, the concrete tie is more and more being used by foreign railroads; consequently, a world-wide market for this item is said to be opening up.

THE END

SYNTRON cost-reducing equipment of proven dependability

speeds placing and setting concrete



SYNTRON Electromagnetic

CONCRETE VIBRATORS

—produce effective, high speed vibrations (3600 VPM) that flow concrete into place faster and easier—eliminate air pockets and voids—reduce shrinking and cracking. They permit the use of lower slump, drier mixes for stronger, more durable concrete.

They are easily attached to the wall form, pipe form or screed by the use of a simple, sturdy quick acting vise clamp and can be moved from one form to another.

SYNTRON Concrete Vibrators are effective, dependable and require very little maintenance.

You will save time and money with SYNTRON Concrete Vibrators.

Write for complete catalog data

SYNTRON COMPANY

227 Lexington Ave. Homer City, Penna.

Other SYNTRON Equipment of proven dependable Quality

VIBRATORY FLOATS

BIN VIBRATORS

GASOLINE HAMMERS

For more facts, use Request Card at page 18 and circle No. 319

Hydraulically controlled Model 210 A-W crane inches 18-in. cast-iron water main into position in San Diego County, Calif.

How A-W crane speeds pipelaying

"The more we use our 3-year-old Austin-Western hydraulic crane, the more uses we find for it," states B. K. Stoneman Sons, Inglewood, Calif., mechanical contractor.

"For instance," they add, "it is excellent for pipelaying. Hydraulic controls permit placement of heavy pipe with speed and precision. The telescoping boom lets the operator work pipe forward for a perfect joint without even moving the machine. All-wheel drive and steer mean exceptional maneuverability and traction on any surface. The A-W is a real time and money-saver!"

Austin-Western now offers a complete line of *lift, carry and place equipment.* 5 models—capacity ranges up to 11 tons. Wide choice of optional equipment for added versatility. Available self-propelled, truck or stationary mounted. No other crane offers you all of the profitable advantages and quality construction features of an Austin-Western. Let us prove this to your satisfaction. Write for all the facts or ask your nearest A-W distributor.

Austin-Western

CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

For more facts, use Request Card at page 18 and circle No. 320

Two of the 88 tees required for the roof of a zirconium rolling mill at Albany, Ore., arrive at the job site on a Mack Model H69 truck and trailer after a 75-mile haul from the prestressing yard. Adjustable saddles wedge up tight against the webs of the beams to hold them securely in place. A screw device keeps the vertical member of the saddle secure. The upper saddle is attached to 8-foot-long sections of steel channel. Chains also secure the tees.

PRESTRESSING

Long prestressed tees for an economical roof

Contractors and Engineers staff article

Construction of a new zirconium rolling mill for the Wah Chang Corp. at Albany, Ore., started as a race between the designers and the builders. The owner's design engineers started working on the building plans the day the contractor broke ground for the structure.

Long-span tees

It was a close race all the way, but the designers finished the plans before the contractor was able to complete the building.

One of the big factors in this speedy construction and design operation was the use of long-span prestressed-concrete Lin tees for the roof of the 120 × 352-foot structure. Wah Chang's engineers knew just what to expect from the tees, since they already had three other buildings roofed with similar members. The contractor, George A. Moore & Associates, Portland, found the units readily available and learned that they went into place quickly and economically.

The new rolling mill consists of two 60-foot-wide bays, each 304 feet long, with a 48 × 120-foot laboratory section added at one end. The laboratory is a completely separate structure.

The building frame consists of three rows of 18-inch round columns rising 28 feet above the floor. Precast spandrel beams span the 19-foot spaces between the columns in each row and support the prestressed single tees that span 60 feet between the rows of columns. Double corbels on all of the columns provide seats for crane rails running the length of the building.

Lightweight concrete-block masonry curtain walls were constructed between the columns.

Inside the building, heavy separate foundations support the many pieces of processing equipment.

Columns cast in place

Each column is founded on an 8 × 8-foot spread footing carried down to soil with a bearing value of at least 3,000 pounds per square foot. The columns were formed with Sonotubes and cast in place. Eight sets of

MANITOWOC 4500 VICON®

the only *really new* excavator design since steam!

MANITOWOC

The Manitowoc Model 4500 VICON represents the most outstanding advancement of excavator design in decades. Here is a 6 yard shovel or 7 yard dragline incorporating new, tested design principles to give you more yardage in less time than any other mechanical or electrically driven shovel-drag in this size range. Thoroughly proved on the job for over three years, VICON design has increased yardage 25% or better, substantially reduced maintenance costs, and piled up more profits for owners. Some exclusive VICON features are:

INTEGRATED CONTROLS that serve both as clutch operating levers and as engine throttles, providing variable speed control over each function. Clutches, being responsive to lower range of control pressures, are engaged before engines are accelerated. Slippage and overheated friction surfaces are eliminated, lengthening clutch life appreciably.

HOIST AND DRAG DRUMS ARE INTERLOCKED to automatically synchronize their operation. Cycle time is faster and output is greater because full horsepower is always available for hoist—the operator doesn't "soak" it up with the drag brakes. Operating costs are noticeably less because brake use is cut by 50% and lining wear is drastically reduced. Another advantage of the VICON interlocked drum arrangement is that the operator can "power lower" or free-cast the bucket.

DUAL INDEPENDENT ENGINE POWER with one engine powering the main drums, and the second all other functions. Here are all the advantages of electric or conventional diesel engine mechanical drive without the disadvantages of each. You get the performance characteristics of electric drive — smoother power flow, variable independent speed control, simultaneous operation of dig, hoist, swing, and propel functions—without sacrificing mobility, without incurring the headaches and special maintenance problems of electric drive, without needing a separate power source at every job site. You get the simplicity of mechanical drive without losing valuable production time because of engine "lug down", without needing to jam clutches into engagement at high and harmful engine speeds, without the limitations of operating speeds that are inherent in conventional diesel engine drive.

Why not get the complete story on the *sensational* Model 4500 VICON today? Your nearby Manitowoc distributor has all the facts.

9-A ° Variable Independent Control

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
Manitowoc, Wisconsin

SHOVELS	CRANES	DRAGLINES	TRENCH HOES
1¼ — 6 YDS.	25 — 125 TONS	1¼ — 7 YDS.	1½ — 3 YDS.

For more facts, use Request Card at page 18 and circle No. 321

el forms were fabricated for the rbeled sections of the columns. The notubes were used both below and ove the corbeled sections. Each col- n was cast in two lifts.

ile the columns were being formed d cast, the spandrel beams were g precast on the job site. Uni- rm panels were set up to produce r of the 18 × 28-inch 16-foot-long ams at a time. Two Superior 1-inch ting inserts were placed in the top ar each end of the beams. A Lorain 0-ton motor crane set the beams in lace on the columns. The ends of he beams were doweled to the col- mns with two 1-inch reinforcing ars. After being set, the beams were ed together with 1 × 3-inch steel lates, 4 feet long, which reached ver the joints and were bolted down o the Superior lifting inserts.

Prestressed tees

While this work was in progress on the job site, the roof tees were being fabricated in Portland at the prestressing plant of Empire Building Materials Co. These are Lin tees, 8 feet wide, 2 feet deep, and 60 feet long. The flanges widen from 2 to 4½ inches in thickness, and the stem is 8 inches wide. Each tee is reinforced with 12 Roebling. ⅜-inch prestressing strands in addition to some conventional reinforcing. Loops of waste prestressing cable were cast into each end of the tees for lifting attachments.

The tees were cast of Literock aggregate, Empire's brand of expanded-shale aggregate. They weighed an average of 12 tons each. Empire also supplied lightweight concrete blocks made with the same aggregate for the building walls.

Trucks haul two tees

Empire hired the Wilhelm Trucking Co., Portland, to transport the 86 big tees from Portland to Albany, a distance of about 75 miles. To make the haul economical, the trucker had to deliver two tees per load. This brought the rig very close to the maximum allowable load on the highways. But the biggest problem was to mount two of the tees on the bunks of the truck and trailer.

Wilhelm came up with an arrangement that worked well. The lower bunk of the truck and trailer was fitted with adjustable saddles that could be clamped up tight on the stem of the tee. A second pair of similar saddles was attached to 8-foot-long sections of steel channel. These channels and saddles were placed on the flanges of the first tee, directly over the saddles on the bunks below, and chained down securely.

The second tee was then set into this upper pair of saddles, which was clamped tightly on the stem. The upper tee was also chained down to the truck. Two rigs, thus equipped, hauled all of the tees without incident, each averaging a load per day. These were Mack cab-over-engine

(Continued on next page)

The masonry subcontractor uses a Ford tractor with a rear-mounted lift to deliver wheelbarrows of mortar from the mixer to workmen building the masonry walls between the columns of the structure. The wheelbarrow can easily be raised to the height of the Safway scaffold, if necessary. The rig also delivers pallets of blocks to the crew.

DAY-NIGHT
6 AMERICANS WORK AROUND THE CLOCK ON NORTH AMERICA'S BIGGEST POWER PROJECT

WORK NEVER STOPS on the gigantic $720,000,000 Niagara Power Project, largest hydro-electric development in the Western Hemisphere. Five American Revolvers work at three levels on Merritt-Chapman & Scott's $98,800,000 contract for the main Niagara Generating Plant. By day they handle material, set forms —at night, pour concrete. A total of 1,200,000 cubic yards of concrete and 42,000 tons of steel will go into this structure alone!

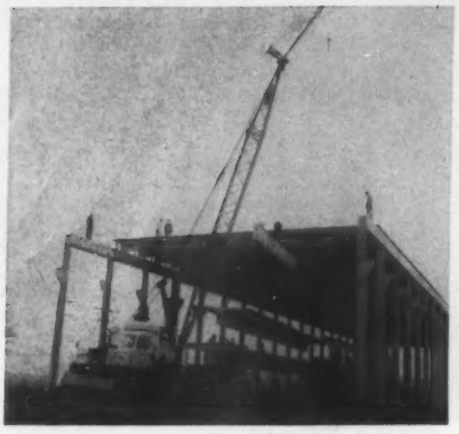
American's work-horse dependability is essential for contractors on penalty jobs like this where equipment failure can eat-up profits fast. Top contractors choose top rated, tough American Cranes to keep jobs on schedule.

Write for detailed, illustrated information on the complete line of American equipment specially engineered for a wide range of construction and materials handling duties—for excavation, erection and operation.

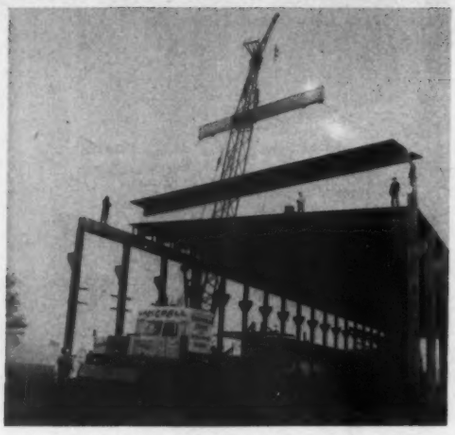
AMERICAN HOIST and Derrick Company
St. Paul 7, Minnesota

EXCAVATORS-CRANES to 4½ yds.-110 tons
LOCOMOTIVE CRANES to 130 tons
DERRICKS-HOISTS to 800 tons
REVOLVER CRANES to 400 tons
CROSBY-LAUGHLIN DIVISION
Forged fittings for wire rope-chain

For more facts, use Request Card at page 18 and circle No. 323



The long-span tees are set in place by a Lorain 30-ton crane with 70 feet of boom and 15-foot jib. It uses a spreader 28 feet long and weighing 3,000 pounds.



Workmen block up the flanges with 4 × 4 shores. The space between spandrel beams and flanges is later built up with concrete blocks. Tees are 8 feet wide, 2

feet deep, 60 feet long; flanges are from 2 to 4½ inches thick. Tees contain some conventional reinforcing, as well as the 12 Roebling ⅝-inch strands.

(Continued from preceding page)

Model H69 trucks with specially extended trailers.

As the trucks delivered the tees to the job site, the Lorain 30-ton motor crane picked them off the rigs and set them directly in place on the spandrel beams. The crane used 70 feet of boom and a 15-foot jib and carried a 28-foot spreader on its load line.

Workmen blocked up the flanges of the tees with 4 × 4 wood shores as the tees were set. Later, the spaces between the spandrel beams and the flanges of the tees were filled in with concrete-block masonry. A 2-inch layer of lightweight concrete with mesh reinforcing was placed before roofing was applied. The ½-inch insulating board placed over the tees was covered by a 3-ply built-up roof.

Masonry walls

The exterior building walls were constructed of lightweight concrete blocks laid between the round columns. Wire ties had been inserted into the columns through the Sonotube forms during casting. These ties secured the block masonry to the columns. Each column shows as a rounded bulge extending both inside and outside the block walls. Fiberglas panels near the top of the walls admit light.

The masonry was done by a subcontractor, Merle Schroeder of Portland. Schroeder set up Safway scaffolding for the workmen building the

In constant demand on the job was this Scoopmobile with its 24-foot tower. It carries a scaffold for workmen placing anchors on the corbels for overhead crane rails.

Field Performance Report

Users confirm that DOUBLE GRAY-X® Wire Rope lasts longer on tough jobs

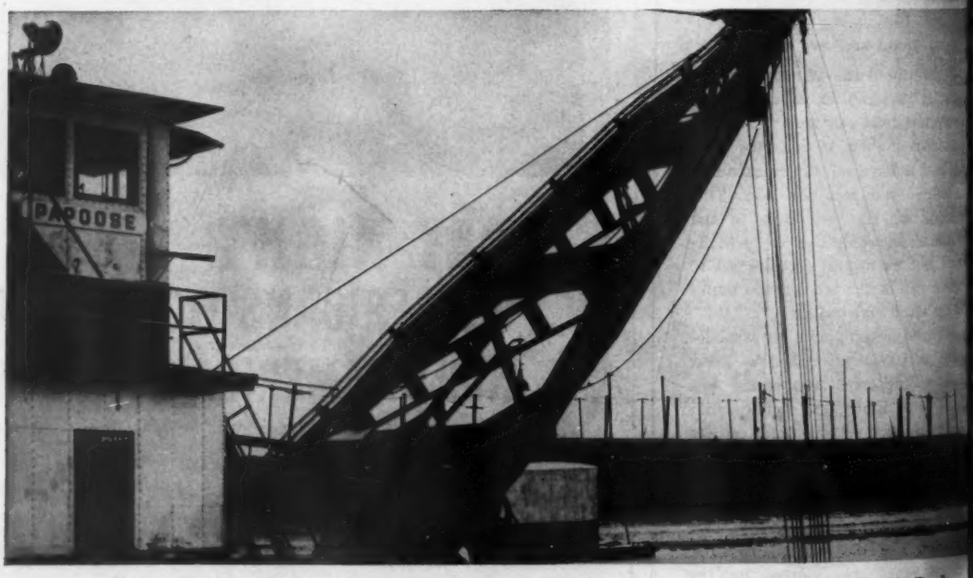
Field reports are now coming through on CF&I-Wickwire's superior new wire rope—Double Gray-X. These reports, a few of which are summarized here, all agree on one point — when the going really gets tough, Double Gray-X lasts longer than other wire ropes.

Double Gray-X is the result of CF&I's intensive research program leading to the discovery of a remarkable new wire-drawing technique. This process includes the use of Molysulfide* in the lubricant, which creates a *permanent molecular shield* around the individual wires, resulting in these benefits:

- **reduced friction between individual wires in every strand of Double Gray-X during service;**
- **smoother wire surface, which helps eliminate "weak links" that can cause breakage and improve service life;**
- **greater resistance to abrasion, crushing, bending**

And—in addition to longer life—Double Gray-X gives you extra strength. Made of extra-improved plow steel with an independent wire rope core, this rope gives 15% higher breaking strength than the catalog breaking strength of an improved plow steel rope with IWRC.

Double Gray-X is made in a wide range of sizes and constructions. It's available from CF&I-Wickwire's chain of warehouses and nation-wide network of distributors. For complete details, call the nearest CF&I sales office or a Wickwire Rope distributor.



REPORT: ON THE SACRAMENTO RIVER, two dredges – the *Papoose* and the *San Diego*—are sucking up tons of silt to help make Sacramento a seaport. Both use Double Gray-X for lines on swings, spuds and ladders.

Captain Nick Carlson of the *Papoose* (Hydraulic Dredge Company) says: "The Double Gray-X rope that holds the suction head really takes a beating on both spud and swing lines, but it's still in fine shape. However, another brand of wire rope put in at the same time is beginning to show wear."

Captain Ralph Vea of the *San Diego* (Pacific Dredging Company) reports: "When you're down with rope failure in this business, you're really out of production. But Wickwire Rope, which we have been using for nineteen months, really keeps us going. We used to change swing lines every six weeks, but the Double Gray-X we have on there now has been in service nine weeks already. That new protective shield on the rope really does the job."

*Registered Trademark of Climax Molybdenum Co.

high walls. He used a Ford tractor with a rear-mounted lift to raise mortar and blocks to the scaffold.

The general contractor had a Jeepmobile fitted with a 24-foot-high tower. This was in constant demand for work of one kind or another at the high levels. Another much used machine was a Bucyrus-Erie Hydro-crane on a Mack truck. This rig handled all but the heavy lifts, which were taken by the Lorain crane supplied by Campbell Crane & Trucking Service, Portland.

The Wah Chang Corp. Zirconium division refines, processes, and fabricates items of zirconium and other nonprecious metals, including hafnium, columbium, and tantalum. These products are used primarily in atomic reactors, such as those in the Navy's atomic-powered submarines.

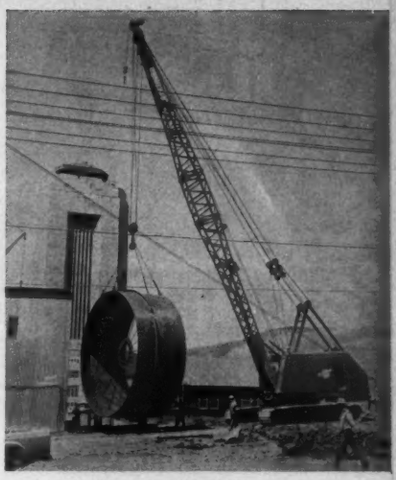
Richard Hanstad, supervising the job for George A. Moore & Associates, Portland, keeps a close eye on the progress of the work.

The process in the multi-unit plant starts with the sandlike ore and carries through to the finished metals and alloys. The principal end products are sheets and wire.

Completion of the new rolling mill will enable the plant to roll its own sheets and shapes. This work has previously been done in other plants.

Personnel

The project was supervised for George A. Moore & Associates by superintendent Richard A. Hanstad. General foreman was Edward Columbus. For the Wah Chang Corp., Kenneth E. Royer is plant engineer. John Fortner, superintendent of zirconium, maintained liaison with the contractor on the job. The plant design was handled by Glen Jueng, civil engineer of the Wah Chang staff. Arthur James of Portland served as consulting engineer. THE END



A RING OF STEEL TUNNEL LINER, weighing 17½ tons, is being walked 200 feet by a Manitowoc Model 3900 crane. The rings are automatically welded together during construction of the second power plant of the Fort Peck Dam at Fort Peck, Mont., under way for the U. S. Army Corps of Engineers. The crane, owned by Chicago Bridge & Iron Co., will handle most of the estimated 9,100 tons of steel to be used on the contract, scheduled for completion by February, 1961.

Handbook describes wire-fabric uses

■ A new "Building Design Handbook" has been published by the Wire Reinforcement Institute, Washington, D. C., for those concerned with reinforced-concrete construction.

The 168-page book has two parts. The first consists of general text and pictures describing the ways in which steel wire fabric is used and includes tables, detail drawings, and case histories. The second part of the book deals with heavy welded-wire fabric and is principally a series of actual design tables, with explanatory text. Included are tables for slabs with heavy wires placed in either one or two directions, and tables for designers of tilt-up concrete wall panels, cantilevered retaining walls, and square individual column fittings.

The handbook includes complete instructions on detailing and ordering welded-wire fabric. It is available without charge, if requested on an organization's letterhead, from Dept. BH-70, Wire Reinforcement Institute, 1049 National Press Bldg., Washington 4, D. C.

Interstate System opens 250 more miles to traffic

■ Well over one-fifth of the National System of Interstate and Defense Highways is now in use by traffic. More than 9,100 miles of the 41,000-mile system have been completed, and construction is under way on another 4,700 miles.

In the three months ending June 30, 250 miles were added, according to the Bureau of Public Roads. The total mileage of 9,107 includes 2,274 miles of toll roads, bridges, and tunnels incorporated into the system.

A Calendar of coming conventions appears on page 59 of this issue.

PORT:

THE MOUNTAINS OF COLORADO, the Hopkins Construction ...pany relied heavily on Double Gray-X on "two of the toughest ...truction jobs we ever handled." Both required the moving of more ...300,000 cubic yards of material. Many different types of earth-...ing equipment, including the power shovel pictured above, were ...ed with Double Gray-X — with these results:

...ident Hopkins: "Every minute of working time counted on the ...ynne Mountain job because we faced a $5,000-a-day penalty if we ...n't finish it in 45 days. The service we got from Double Gray-X was ...derful. We didn't lose 1% of downtime because of rope failure — ...d we completed the job in exactly 45 days."

...ne Rundle, Project Superintendent on the South St. Vrain Canyon ...: "Rope life has been improved and downtime cut drastically since ...witched to Double Gray-X. Maintenance is no problem at all. We ...grease the rope when needed."

REPORT:

ON ROTARY OIL RIGS of the Falcon Seaboard Drilling Company, a prototype of Double Gray-X underwent tests that put wire rope to the most extreme abuse. Mr. Jack Starr, Vice President in Charge of Drilling, comments: "The results obtained with the original prototype of Double Gray-X led to our decision to order a carload of this improved product. Falcon Seaboard insists on the best products to serve the oil industry in accordance with today's modern standards."

WICKWIRE ROPE — DOUBLE GRAY-X — DOUBLE GRAY-X — CF&I A PRODUCT

WICKWIRE ROPE

THE COLORADO FUEL AND IRON CORPORATION

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In the East: WICKWIRE SPENCER STEEL DIVISION — Boston • Buffalo • Chattanooga • Chicago • Detroit Emlenton (Pa.) • New Orleans • New York • Philadelphia

2780

For more facts, use Request Card at page 18 and circle No. 324

Working from a finished section of the bridge, a Lorain 50-ton crane sets a 35-foot-long, 6½-ton prestressed deck section for a private bridge built for Frontier Refining Co. near Meeker, Colo. The company needed the 105-foot bridge to move a heavy drilling rig.

Prestressed bridge built in five days

Contractors and Engineers staff article

The Frontier Refining Co. needed a private bridge built in a hurry to span the White River 26 miles west of Meeker, Colo. Just ten days after inquiry was first made of the contractor, Frontier's 3-span, 165-foot prestressed-concrete bridge was completed and ready for use.

E. B. Granville, drilling and production superintendent for Frontier, obtained some general information on bridges from the Colorado Department of Highways. Then he telephoned James B. Kenney, Inc., Denver contractor, and asked for a bid on the installation of the proposed bridge so that Frontier could move in a large rotary rig to meet a drilling deadline.

That same day, Earl Kenney called Prestressed Concrete of Colorado, Inc., Denver, for design information on a bridge to carry the heavy loading requirements. Plans for a prestressed-concrete bridge were approved, a contract was executed, and after only five days of actual construction time, the bridge was completed and turned over to Frontier. The structure was built to the same load specifications as bridges used on major highways.

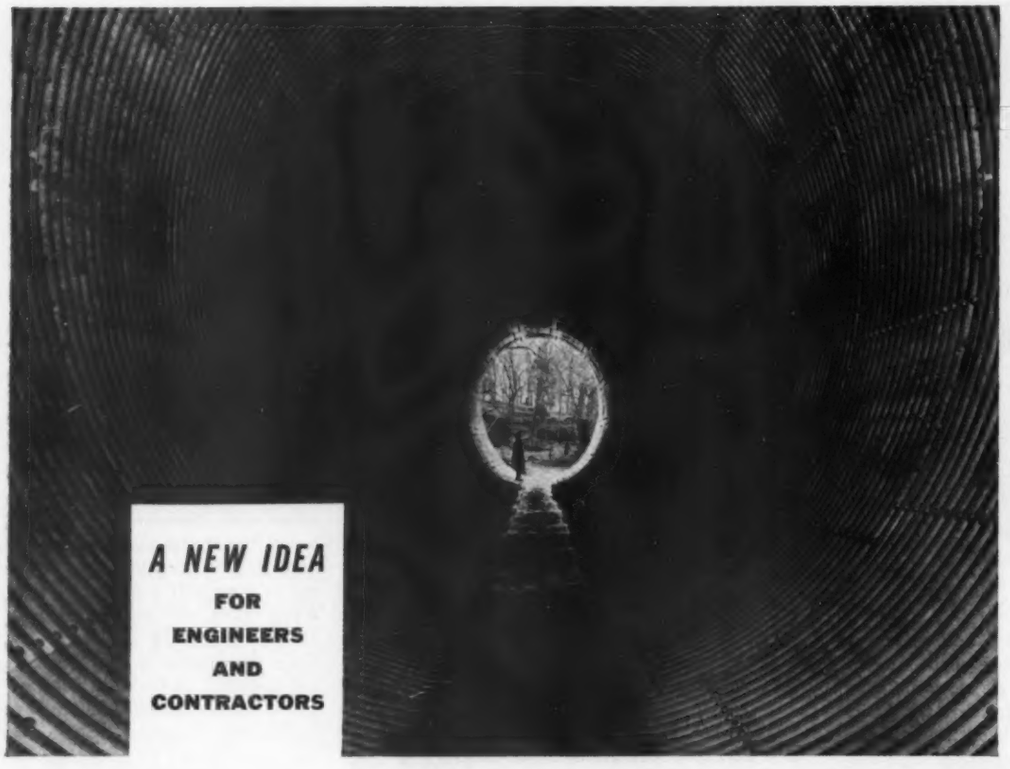
The 3-span structure is founded on two piers and two abutments, each consisting of four steel H-piles driven to bearing in the underlying rock and capped with precast-concrete caps. The 13-foot-wide deck is made up of three heavy double-tee sections placed side by side on each of the 35-foot spans. Since there are no railings, the structure provides unrestricted width for the bulky loads frequently encountered in oil-field operations.

The caps and deck members were cast in the Denver plant of Prestressed Concrete and trucked the 220 miles to the bridge site. The prestressing strands for the tees were pretensioned.

Saves time and money

According to Granville, the prestressed-concrete construction not only saved time but also saved as much as $7,000 of the cost of a similar steel structure. He anticipates that there will be further savings in maintenance expense.

Since the clay soil that predominates in the area makes roads costly to maintain, the bridge site was selected to provide a road of minimum length to the well location. This location required just about a quarter of



Giant Armco Pipe Replaces Old Bridge

Corrugated metal drainage structures are now being built *larger* and *lighter* than ever before thought possible. The method, calling for the corrugated metal conduit to act as a compression ring, has evolved from Armco's extensive laboratory research and almost 60 years of field experience. This method *greatly reduces costs!*

In this specific case, an 18-foot diameter, 7 and 10 gage Armco MULTI-PLATE® structure—much lighter than shown in present gage tables—replaced an old county bridge in Ohio.

How was this designed and installed? A full report, presented to the Highway Research Board in Washington, D. C., this year, outlines the methods used. A copy of this report, "The Corrugated Metal Conduit as a Compression Ring," is yours for the asking. Just send in the coupon. Armco Drainage & Metal Products, Inc., 7270 Curtis Street, Middletown, Ohio.

Steel

New steels are born at Armco

ARMCO DRAINAGE & METAL PRODUCTS, INC.
7270 Curtis Street, Middletown, Ohio

- ☐ Send "The Corrugated Metal Conduit as a Compression Ring."
- ☐ Send catalog.
- ☐ Have salesman call.

Name_____

Street_____

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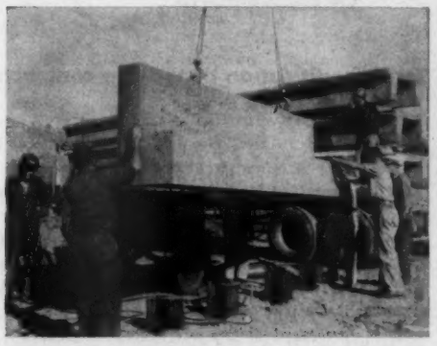
For more facts, use coupon or Request Card at page 18 and circle No. 325

◄ The Lorain sets the last of the three spans from a position on the middle span. During this work, the bridge carried a load consisting of the 84,000-pound crane and the 80,000-pound truckload of deck members. Each span is made up of three deck sections set side by side on precast pier caps. H-piles, driven to bearing and braced by an H-pile welded to them, carry the pier caps.



A precast-concrete cap is being placed on H-piles driven into the ground for one of the abutments. Deck sections for a span are ready to be placed. ►

a mile of road from U. S. 64 to the bridge site.

Construction takes five days

The steel H-piles were supplied by Mountain States Steel Co., Provo, Utah, and were delivered to the site just an hour before the arrival of the pile-driving rig. The piles were driven to bearing and tied together with a section of the H-piling welded to the faces of the four piles.

The erection of the concrete deck began at one abutment and continued on across the structure. A Lorain 50-ton motor crane picked the precast sections off the trucks and set them directly in place on the structure. First the abutment and one pier cap were set. Then the crane placed the deck sections for that span. Moving out onto the first span, the crane set the pier cap and the deck sections for the next span.

As the crane moved ahead onto the second span, the truckload of precast sections moved out onto the first span. This loading was probably as heavy as any the bridge will receive in its normal use. From the second span, the crane set the cap for the abutment on the far shore and then proceeded to set the remaining deck sections.

While the structure was being erected, another crew built the approach roads. As soon as the joints at the bridge piers had been grouted, the structure was ready for use.

The Frontier Refining Co., operator of the federal unit in which Shell Oil Co. and The Trident Co. of Rangely have interests, is currently drilling a well, which is projected to a total depth of approximately 11,000 feet. The well is located in Rio Blanco County, and the drilling contractor is the Lewis Drilling Co. of Denver.

Personnel

The construction foreman on the job for the James B. Kenney organization was Frank Skrbuna. Bill Kunkler coordinated the design work for Prestressed Concrete of Colorado, Inc. R. J. Funk, petroleum engineer for Frontier, supervised the field work, including construction of the road leading to the bridge. He was also instrumental in locating and obtaining the steel H-piles during the time the steel strike made the material scarce. THE END

For more facts, use Request Card at page 18 and circle No. 326 ►

NOW! a Euclid 14-yd.* scraper with all-wheel drive!

TS-14 features that cut dirt moving costs

2 engines — 296 total h.p.
all-wheel drive
NoSpin differentials
2 Torqmatic Drives
converter lock-up
20 yds. heaped
(14 yds. struck)

*heaped capacity at 3:1 is 16 yds., at 1:1 slope, 20 yds.

HERE'S BIG NEWS for scraper users. The many cost cutting advantages of all-wheel drive are now available in a medium-size scraper, the Euclid Model TS-14. With Twin-Power and a total of 296 h.p. this new "Euc" has already proved itself an outstanding performer. A one-man, one-machine earthmoving spread, it gets more work done at lower cost than any other scraper of comparable size . . . its high productive capacity brings a better return on investment.

Like the widely used 24 yd. "Twin", this new Euclid has a separate Torqmatic Drive and power train for each axle. It self-loads in practically any scraper material and with a pusher is a big producer on even the toughest jobs. There's plenty of power and traction to pick up a heaped load in a hurry . . . pull out of the cut fast . . . and highball on the haul and return.

The TS-14 works on grades and under adverse job conditions that stall other scrapers. Its ability to do a wide range of work — without pusher assistance — makes it the most versatile scraper in its class. This new "Twin" can lengthen your work season and give you a bidding advantage on that next job. Get the facts and figures from your Euclid dealer. EUCLID Division of General Motors • Cleveland 17, Ohio

Check the advantages of all-wheel drive in this new TS-14 Twin-Power Scraper!

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Avoid legal pitfalls

Oral modification of written contracts

THE PROBLEM: *A written contract called for construction of a building according to detailed drawings and spex and specified that there should be no deviation from these, and no change or substitution of materials "without prior written approval of the owner." The owner paid the total contract price on completion of the work, but refused to pay extra cost involved in installation not called for by the written contract and for increased cost due to the use of larger cement blocks in the foundation, tile flooring instead of wooden flooring, and other substitutions. Was his refusal justified because the extras and substitutions were not authorized by him in writing?*

THE ANSWER: No. (Bailey v. Martin, 112 S.E. 2d 807, decided by the Georgia Court of Appeals, Division No. 2.)

The court applied the rule of law generally recognized by courts that the terms of a written contract may be modified by a subsequent oral agreement. This rule applied despite the provision in the written contract that changes or substitutions must be authorized in writing. The legal effect of the agreed changes was to discard the written contract and substitute a new oral agreement embodying the unaltered terms of the written contract as modified by the later oral agreement.

Obviously, this litigation might have been avoided had the contractor insisted that the owner sign a written promise to pay the extra costs involved in the departures from the original plans and spex. The clause calling for his approval in writing should have been stricken before the contract was signed or, if it was not stricken, the contractor should not have furnished the extras or substitutions without first securing the owner's written order.

Material-lift injury

THE PROBLEM: *A building contractor's assistant superintendent, in performing his duties, rode a lift operated by a brickwork subcontractor, knowing that doing so violated established safety rules. A buggy carrying brick on the lift moved, because the wheels were not blocked, tilting the lift and causing injury to the assistant superintendent. Was the subcontractor liable?*

THE ANSWER: No. (Smith v. John B. Kelly, Inc., 275 Fed. 2d 169, decided by the United States Court of Appeals, District of Columbia.)

The court said there was no proof that the subcontractor had exposed the injured man to any risk that was not obvious to the latter, who, though not a trespasser, had not been invited to ride the lift.

Child drowned in pond on company's premises

THE PROBLEM: *A 9-year-old boy drowned in an artificial pond created by a construction company in quarrying rock and gravel on its own premises. Was the company liable?*

THE ANSWER: No. (Washabaugh v. Northern Virginia Construction Co., 48 S. E. 2d 276, decided by the Virginia Supreme Court of Appeals.)

The court rejected a contention that the company, after knowing that children were wading or swimming in the pond, failed to maintain barricades and warning signs. The court said that the pond created no more peril to children than if it had been a natural pond and that the primary duty to inform, advise, and protect a child against such natural, open, and obvious dangers is upon the parents and not upon strangers. To require the proprietor of such a business enterprise to erect a fence or barricade around a pond and across a private road, of such a character that it would prevent adventurous youth from entering, would impose a a burden that would unduly interfere with the lawful use of the property.

Rehearing of damage case to determine liability

THE PROBLEM: *The Massachusetts Public Works Department condemned land for a limited-access highway without acquiring rights on adjacent land on which an electric power company maintained a power line. A contractor constructed a stone and gravel embankment carefully in compliance with the contract specifications, but there was such disturbance of the soil as to cause damage to two transmission poles of the power company. The company sued the contractor for damages. Was the contractor conditionally liable?*

THE ANSWER: Yes. (Boston Edison Co. v. Campanella & Cardo Construction Co., 272 Fed. 2d. 430, decided by

ON ROAD WORK—

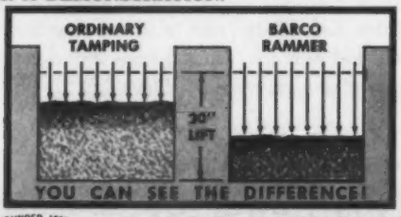
Tamping fill around 4 ft. concrete pipe culvert on New York State Thruway Extension near West Seneca, N.Y. The Barco Rammers are owned by S. J. Groves & Sons Co., Syracuse, N.Y. (Photo: CONSTRUCTIONEER)

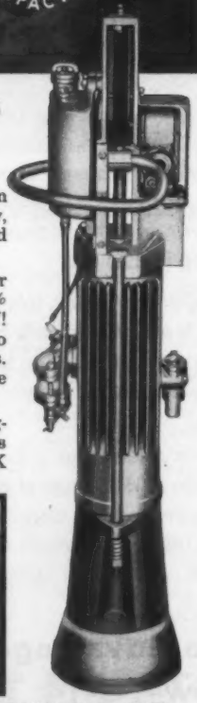
Barco Rammers are Essential

CHECK THE RECORDS for *soil compaction* on every top ranking highway, toll road, thruway, or freeway built in recent years and you will find Barco Rammers!

Easily meet rigid specifications—In test after test, Barco Rammers have delivered 95% to 97.5% compaction (modified Proctor Method)—EASILY! EFFICIENTLY! ECONOMICALLY! The Barco Rammer is especially useful in restricted areas. ONLY Barco can produce specified high degree compaction on lifts up to 20 inches.

Get jobs finished on time—One of the biggest advantages offered by Barco Rammers is ability to handle work in minimum time. ASK FOR A DEMONSTRATION.





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CM HOISTS AND PULLERS are ruggedly constructed to give you years of trouble-free service. Yet they are unusually light...easy to handle because they are constructed of the strongest alloys of steel and aluminum. Equipped with famous CM-Alloy flexible, welded alloy steel load chain.

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- 96% efficient—easy to operate.
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For more facts, circle No. 328

...United States Court of Appeals, ...Circuit.)

The court vacated an order of the United States District Court for Massachusetts dismissing the suit and ordered a rehearing of the case and a new decision conforming to this theory: If damage to the transmission poles by disturbance of soil on which they stood was not avoidable as an economic practicability, the Commonwealth was liable under condemnation statute, freeing the contractor from any liability to the power company, but if the injury was due to negligence on the part of the Department of Public Works, it was not legislatively authorized and the contractor could not avail himself of such an unwarranted act for protection.

It was agreed that the contractor in all respects followed the contract specifications and performed the work carefully. It was also agreed that the Department of Public Works knew or should have known that excavating the peat and replacing it with stones and gravel in large quantities would cause the peat to move which would, in turn, move the plaintiff's poles.

Here are the court's principal conclusions:

It is an inescapable inference that there are various possible methods by which fill can be stabilized . . . so that encroachment upon distant property . . . [will] not occur. However, the fact that this would have been possible does not mean that it would have been economically practicable, which is the Massachusetts test in this situation. In the case of Todd v. Old Colony R.R., 194 Mass. 302, 80 N.E. 462, embankments constructed over a brook by the defendant temporarily discharged silt, affecting the lower riparian owner. Although there was evidence that this might, to some extent, have been avoided, the defendant's experts testified that it would not have been "possible" to construct the embankments so as to prevent all discharges. The court said, in adopting their view, "When the witnesses testify that it is not possible to do a certain thing, such as preventing the wash of the embankment, for instance, we do not understand them to mean that, considered merely as an engineering feat, it cannot be done, but to mean that the expense would be so disproportionate to the end to be reached as to make the proposed act, from a business and common-sense point of view, impracticable." The Massachusetts court in that case therefore concluded that a damage suit was not proper since the plaintiff had not shown that the defendant railroad company had done any act not reasonably necessary and proper. Hence it had done no act not authorized by law.

In the case before the Court of Appeals, it was evident that the damage was foreseeable and avoidable, but the evidence presented was insufficient to permit a considered finding of whether it was avoidable within the test of economic practicability. Hence, a new trial was needed.

For more facts, use Request Card at page 15 and circle No. 329 ▶

Contractor demanded payment prematurely

THE PROBLEM: *The developer of a housing project let sewerage construction under a contract that called for final payment upon final approval of the work by an engineer, and furnishing of an official certificate that no liens existed on account of the work. The contractor completed 97 per cent of the required work. On the engineer's certificate that 3 per cent of the work was uncompleted and his recommendation that a proportionate part of the price be retained, the owner acted accordingly. The contractor sued to collect the balance, claiming that the owner waived the contract clauses mentioned by taking possession of the project and selling it to the city. Was the contractor entitled to collect the balance of the contract price?*

THE ANSWER: No. (Hooter v. Farrar, 116 So. 2d 723, decided by the Louisiana Court of Appeal, Second Circuit.)

Trespasser killed

THE PROBLEM: *Over weekends a levee contractor left two vehicles parked on a river bank, in such condition that they could be started by merely stepping on the starter. Employees off duty, fishermen, and others rightfully on the bank had run the machines back and forth. The deceased and his cousin, both in their twenties, but neither connected with the construction work, planned to do the same. While the deceased was preparing to start one of the machines, his cousin accidentally ran the other over him, fatally injuring him. A state statute was so worded as to make it a criminal act for trespassers to start motor vehicles. Was the*

Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

FAST DELIVERY—EXPERIENCED TECHNICAL SERVICE

Two big advantages contractors get when buying STANDARD Asphalt

Resurfacing old concrete with Asphalt on Illinois Highway 173 between Antioch and the Tollway is typical of the jobs taken on by Skokie Valley Asphalt Company. Backing them up on such jobs is a ready source for Asphalt, less than 25 miles away—the Standard Oil refinery at Whiting, Indiana. Also ready to help them with advice on Asphalt application and to trouble-shoot other problems is an experienced Standard Oil Asphalt representative, Barney Toale. Barney Toale is stationed in Chicago within a few miles of the job. He's on call any time the contractor needs his help.

This kind of service from Standard Oil helps contractors complete jobs on time. The same sort of service is available from Standard anywhere in the 15 Midwest or Rocky Mountain states. Delivery of Asphalt is made from five refineries strategically located for best service to contractors. Experienced Asphalt technical service is likewise available wherever there's a paving job. To get this help, call the Standard Oil office nearest you. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from STANDARD *and you get it!*

John Onan (right), Skokie Valley Asphalt Company foreman, and Standard's Barney Toale watch paving operation on Illinois 173. Providing assistance to contractors on Asphalt applications is Barney's job. He's been rendering service to customers for 22 years. He's completed Standard's Sales Engineering School course to further qualify him for such work.

avoid legal pitfalls

contractor liable for damages on the theory that negligently leaving the machines unlocked and in such condition that they could be easily started was the cause of the fatal accident, and that there was implied permission to operate them?

THE ANSWER: No. (Zuber v. Clarkson Construction Co., 315 W. W. 2d 727, decided by the Missouri Supreme Court.)

The statute involved made it a criminal offense for one to climb upon, use, or tamper with a motor vehicle "without permission of the owner." The court decided that the statute covered the vehicles, and that the contractor did not permit the trespass and operation of the machines by merely leaving them in such condition that they could be easily set in motion.

Insurance coverage of contractor's executive

THE PROBLEM: *The president of a demolition company fell from a building while inspecting it for demolition, and was killed. Under the facts and New York law, was the state insurance fund solely liable, as distinguished from an insurer which had issued a policy?*

THE ANSWER: Yes. (Rutan v. Rutan Associates, Inc., 196 N. Y. Supp. 2d 450, decided by the New York Supreme Court, Appellate Division, Third Department.)

Here is the gist of the points decided by the court:

The workmen's compensation policy, which was issued by private carriers to the demolition corporation stated the corporation's business address and stated, as to locations, "All usual work places of the insured, at or from which operations covered by this policy are conducted, are located at the above address unless otherwise stated herein." It then stated specifically the address of the building to be demolished, providing coverage only at the site of the demolition of this building. It did not cover the president's death, which resulted when he was inspecting a building at another location.

The workmen's compensation policy issued by the state insurance fund to the corporation purported to cover all operations, except with respect to the demolition of the one building which had been covered by the policy from the private carrier. It was the master policy, providing over-all protection for the employer including its executives, and it provided coverage for the death of the president when he was inspecting a building at an address other than that which was specifically excluded.

Contractor sued by sub's employee

THE PROBLEM: *The prime contractor on a university building job was sued by an employee of a subcontractor for injuries sustained when a hoist fell upon him due to the negligence of the prime contractor. Was the contractor entitled to indemnity from the subcontractor under the terms of the subcontract?*

THE ANSWER: No. (George Sollitt Construction Co. v. Gateway Erectors, Inc., 260 Fed. 2d 165, decided by the United States Circuit Court of Appeals, Seventh Circuit, reversing a decision of the United States District Court, Northern District of Illinois, Eastern Division.)

The court decided: Illinois law holds that contracts provide a subcontractor shall indemnify the general contractor against loss arising from injuries to the subcontractor, his employees, or the public, or damage caused by the subcontractor, his employees, agents, or subcontractors, or any negligence or carelessness of the subcontractor or his agents, employees, or subcontractors. But contracts do not provide that the subcontractor should idemnify the contractor against damages resulting from injuries to the subcontractor's employees that are sustained in accidents resulting from the negligence of the general contractor.

Rented rig's operator was employed by lessee

THE PROBLEM: *The owner of a gas-compressor station awarded a contract to construct concrete piers on which pipe was to rest. The contractor leased a dragline and the services of an operator from the defendant for a lump-sum charge of $12.50 per hour. The plaintiff, an employee of the contractor, was injured when struck by the dragline bucket, allegedly through negligent operation of the dragline. Was the lessor liable?*

THE ANSWER: No. (Runnells v. Burdine, 106 So. 2d 49, decided by the Mississippi Supreme Court.)

The court noted that courts generally throughout the country rule that the fact a man is in the general employment of one party does not prevent his being regarded, for a time being, as the special employee of a second party to whom his services have been leased by the general employer. But, of course, the decision presupposed that, in operating the dragline, the operator was subject to control by the contractor who hired the man, as well as the dragline, in a single transaction.

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WALL BRACE

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Nails to 2 Sides of a 2 x 4 With Duplex Nails
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- For wall forms, spandrel beam forms, and columns.
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1958 highway statistics available in bulletin

■ "Highway Statistics, 1958," fourteenth in the annual series published by the U. S. Bureau of Public Roads, presents statistical and analytical tables of general interest on motor fuel, motor vehicles, highway-user taxation, state and local highway financing, road and street mileage, and federal aid for highways.

Included in the 150-page bulletin are summaries of motor-vehicle data for 1957 and 1958. Also presented are mileage data and the status of the National System of Interstate and Defense Highways, and the status of the Highway Trust Fund.

Copies of the bulletin may be purchased from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at $1 per copy.

Some previous annual issues of the series are also available. Those for 1953, 1955, and 1956 can be purchased for $1; copies of the 1957 bulletin are $1.25; those for 1952 and 1954 are priced at 75 cents; and those for 1948, 1949, and 1951 are 65 cents, 55 cents, and 60 cents, respectively. The most recent cumulative summary, to 1955, is priced at $1.

Army tests air-delivery maintenance shop

■ An air-delivery maintenance shop, nicknamed the "pod," is being developed at the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Va. It meets space and weight requirements for helicopter transportation and for ground transport in ballast-type tractors or standard military vehicles.

The 2,900-pound model now being tested has a maintenance capability equivalent to a ¾-ton truck-mounted contact maintenance shop. The unit, with wheels retracted, is 52 inches wide, 40 inches high, and 76 inches long. Its equipment includes a combination electric welder and power generator, an oxy-gasoline cutting set, electric drill, electric impact wrenches, and small air compressor.

The "pod" is expected to be available by 1964.

Composite-pavement group holds meeting in Ohio

■ Nineteen leading pavement designers attended an organizational meeting at Ohio State University, Columbus, for the Committee on Composite Pavement Design of the Highway Research Board, National Research Council, Washington, D. C.

The committee is set up to encourage research in structural design of composite pavements—pavements composed of both bituminous and portland-cement materials. It will collect and distribute information and assist in the development of theoretical approaches to design procedures.

Serving as chairman of the committee is Prof. Robert F. Baker, director of civil engineering research at Ohio State's engineering experiment station.

IN DITCHING FOR A PIPELINE THROUGH ROCK, multi-unit drillers like this Le Roi Newmatic 4-drill rig speed the sinking of blast holes. Contractor H. C. Price Co., Bartlesville, Okla., is using this 4-unit drill, carried by a side-boom tractor, on a 335-mile section of 30-inch natural gas pipeline being laid across Arizona. In the July issue of C and E, this piece of equipment was incorrectly identified as another similar rig.

FOR YOU!

WIX factory-trained experts will give you a complete Survey of all the Filters on all your vehicles and set up a sound Filter inventory FREE. And WIX will provide you with a complete Preventive Maintenance Record System that tells at a glance a factual story on every unit on the job. This new service includes check sheets for all vehicles covering operations, repairs, service checks, maintenance and performance. It gives a clear picture on operating costs and sound inventory. Even lists preferred products, sources of supply and "Your Man" and his phone number. Write and we'll tell you how you can have it – FREE!

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Wherever "Mother Earth" is getting a face-lifting job and Preventive Maintenance is really put to the test, WIX Engineered Filtration is no idle bystander. WIX Oil Filter and Air Filter Cartridges have the rugged integrity built into them to keep that dust, grit and dirt out of hardworking engines . . . more positively and for longer periods between change.

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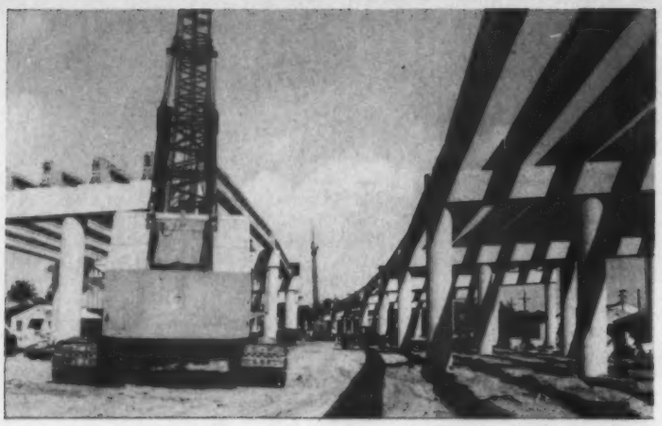


One of the contracts for Interstate 95 through Miami covers this overpass running over city streets. The twin structures have piers of four 3-foot-diameter columns, capped to support eight prestressed-concrete girders per span. Erection of the members is handled by the Manitowoc crane.

Earthmoving, dredging, bridge work make

Interstate sections take shape

Contractors and Engineers staff article

There's plenty of variety in the construction of the new Interstate 95 running through the heart of Miami, Fla., to tie into the southern terminus of the Florida Turnpike. But all the work is going smoothly for the contractors on the many sections, which vary from the .295-mile overpass between N.W. 75 and N.W. 71 Streets to the 1.36-mile project involving earthwork.

Prestressed concrete

L & A Contracting Co., Hattiesburg, Miss., holds the $1,282,000 overpass contract, which consists of two parallel structures carrying the north-south route over Miami streets. Each bridge, which will support three lanes of traffic, consists of piers having four 3-foot-diameter columns formed with prefabricated metal forms.

Eight prestressed-concrete girders are being erected per span by a Manitowoc crane.

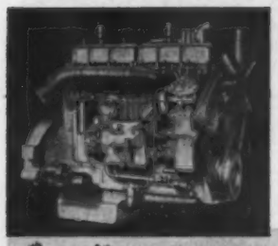
R. H. Wright, Inc., Fort Lauderdale, Fla., holds the 1.36-mile contract section south of the L & A project. This is basically an earth-moving job, and Wright requires over 390,000 yards of borrow material to build up the grades for the two 4-lane roadways to be built.

Wright is hauling in this borrow material with dump trucks and spreading the various lifts with Allis-Chalmers tractor-dozers. Each lift is being completed with steel-wheel rollers.

Dredging contract

Wright also holds another contract that calls for the dredging and stockpiling of over 3 million cubic yards of borrow material. This is being obtained by hydraulic dredging in Biscayne Bay and is stockpiled along the newly built 36th Street Causeway

MOST PRODUCTION with WAUKESHA POWER



A typical Waukesha medium six-cylinder Diesel. Other Diesel, gasoline, and gas models—up to 1200 hp.

For service—in any country—or any climate—stamina and dependability are built-in. Power packed—to pay profits in fast, smooth performance, fuel economy, and low upkeep—Waukeshas are the choice of operators and owners alike. Engine-Generator Sets (ENGINATORS®) for all standard fuels . . . from 50 to 800 KW.

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WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN

Factories at Waukesha, Wisconsin, and Clinton, Iowa — New York • Tulsa • Los Angeles

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100'x24" Stacker is one of four Kolman Stackers used in the production of aggregate at Squaw Valley, California, in preparation of roads and site for the 1960 Winter Olympic Games. Stackers in the background are 70'x24".

PNEUMATIC-TIRED STACKERS IN LENGTHS UP TO 150 FEET

Reports of outstanding performance by the Kolman Model 101-R Radial Stacker are rolling in from all parts of the country. Owners are enthusiastic about bonus features offered by the Kolman Stacker — features like cable suspension of the boom, two-position wheels, balanced electric drive on the head section, power lift, power travel, and cam hinge. Sizes up to 150 feet long build larger stockpiles with a single setting.

MINIMUM SEGREGATION

Kolman's cable suspension design eliminates the segregation encountered with stackers having fixed discharge heights. By raising the stacker as the pile is built, the fall of material is kept at a minimum.

MAXIMUM PORTABILITY

Even the largest Kolman Stackers are on dual pneumatic tires that roll easily on any level surface. Wheel assemblies are mounted in quick-change frames to easily shift from radial arc position for stacking to parallel position for moving from one location to another in the stockpile area.

150'x30" Stacker shown includes electric power lift and electric power travel for finger-tip control of stacker discharge position.

100'x24" Stacker in the background stockpiles sand produced with an 8'x48" double-deck vibrating screen on a Model 101 Kolman Portable Conveyor-Screen Plant.

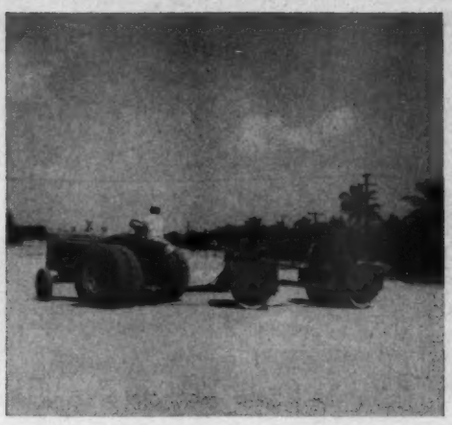
WRITE FOR LITERATURE

KOLMAN MANUFACTURING CO.

4922 W. Twelfth St., Sioux Falls, S.D.

For more facts, use Request Card at page 18 and circle No. 334

Another contract, handled by R. H. Wright, Inc., Fort Lauderdale, Fla., involves 390,000 yards of fill. An Allis-Chalmers HD-16 tractor-dozer is spreading the borrow material.



Bransfield & White, Inc., Ojus, Fla., also has an earth-moving contract. Here, two Essick vibratory rollers are pulled in tandem behind an International ID-9. This contract also includes an interchange.

Dredging of over 3 million yards of borrow material is also being done by R. H. Wright. The material, stockpiled along the 36th Street Causeway, is made available to contractors on different sections.

connecting Miami with Miami Beach. This borrow is being made available by the state to the various contractors working on Interstate 95.

Each of the roadway contractors requiring borrow material has to handle the loading and hauling of the stockpiled material with its own equipment.

The next southern stretch was awarded to Bransfield & White, Inc., Ojus, Fla., and, like the Wright contract, is basically an earthmoving job. The embankment material is spread and compacted by two Essick vibratory rollers, hooked up in tandem behind an International ID-9 tractor.

Included in the contract is a huge interchange that will tie the new east-west 36th Street Causeway into the interstate route. The work on most of these contracts is being supervised by H. M. Post, the resident engineer for the Florida State Road Department. THE END

"Our General 2-3 Ton Roller Paid For Itself in the First Three Months!"

"OUR GENERAL ROLLER IS THE BEST INVESTMENT WE EVER MADE!" say officials of the Garden City Park, N. Y. Water District.

Besides eliminating the use of expensive rental equipment for lawn maintenance, the District's General Roller has cut hand labor costs for road patching and resurfacing in half. In lawn maintenance alone, officials estimate savings for the first three months at $500. Over the same period, operating costs for the General Roller amounted to $5.60—the cost of fuel.

IN ADDITION TO LOWEST SELLING PRICE and economy of operation, the General 2-3 Ton Roller features ease of operation and maintenance. Other features include: LIFETIME GUARANTEE of compaction roll; 12 ft. turning radius; push-button electric starting; Link-Belt roller chain steering; automatic forward and reverse transmission; automotive type hydraulic brakes; oversize water tanks, and roll scrapers with imported cocoa mats.

Also available in ½ — 3-5 — 4-6 Ton Models. Get the details today! Contact the Dealer nearest you or write, wire or telephone direct: Dept.—

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GENERAL ENGINES

GENERAL ENGINES CO., INC., ROUTE 130, THOROFARE, NEW JERSEY

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JS-30'S SHIFTING WHEEL LICKS SNUG TRENCH JOB

THE CLEVELAND JS-30 TRENCHER, with instant lateral shifting and power tilting of its digging wheel, got high daily trench production on a utility job where trench had to be dug in a road shoulder hemmed in by poles, trees and heavy growth on side slopes rising sharply within six feet of the pavement's edge.

Crawlers were steered as necessary to sneak by obstructions, while the JS-30's digging wheel was power-shifted laterally, keeping trench digging right on line. Power-tilting of its digging wheel allowed the JS-30 to dig straight vertical trench with one track higher than the other on the side slopes, without blocking or cribbing.

THE JS-30—A TRENCHER OF AMAZING UTILITY

- Digging wheel power-shifts 5′ from side to side
- Digs trench flush with parallel pavement, curbs, etc.
- Digs trench virtually flush with trees, poles, fences, etc.
- Digs vertical trench on side slopes, cuts blocking, cribbing
- Excavates bell holes, saves on trench width
- Digs 11″-24″ wide, to 5½′ deep; digs to 6′ wide with power-shifting of wheel
- 100% control of all operations at operator seat.

Get the complete story on the JS-30 from your distributor

The CLEVELAND TRENCHER Co.

20100 ST. CLAIR AVE. • CLEVELAND 17, OHIO

Good Everywhere

For more facts, use Request Card at page 18 and circle No. 336

SOME 8,000 YARDS OF CONCRETE for the Divisional Headquarters Building of Public Service Co. of Indiana, Inc., is being furnished by Central Mix Concrete Corp., Kokomo. A CMC Model 700A all-aluminum Transcrete mixer, mounted on an Oshkosh 6-wheel-drive tandem, heads out from the plant for the job. The truck, with weight distribution of 18,000 pounds on the front axle and 32,000 pounds on the tandem axle, allows the mixer to haul 7 yards of concrete legally.

THIS GIFT GIVING IDEA IS SO SIMPLE
it's a wonder someone didn't think of it before . . .

If YOU have the problem of selecting the Christmas gifts that must please EVERY ONE of your employees, prospects or customers, the smartest way out is TO LET THEM PICK THEIR OWN GIFTS.

The above pictured GIFT-BOOKARD is the simple, sensible and economical way of doing just that. It enables you to say "Thank You" to anyone . . . without first trying to read their minds . . . and without the inevitable mistakes.

The Gift-Bookard is a combination of personalized Greeting Card, a registered Gift Certificate in the form of a postage paid reply card, and a colorful booklet offering recipients a choice of 24 impressive gifts.

The Gift-Bookard eliminates all work and worry on your part. All you do is order the exact quantity you need, whether 50 or 50,000. We imprint the covers (or you may design and print your own) and supply mailing envelopes. Each person who receives a Gift-Bookard from you picks the one gift he or she prefers, by mailing the attached Registered Gift Certificate card back to us. We supply the gifts, wrap them and ship them prepaid . . . all for only $6.50 each.

A special feature of the Gift-Bookard is the useful and worthwhile nature of the gifts, each of which is valued to $10. and is unconditionally guaranteed. The 24 gifts are shown in full color and almost anyone would enjoy personally choosing and using any of these beautiful gifts.

What's more, you have tastefully exposed your name to the recipients twice . . . once with the Gift-Bookard, then with the gift. You save time, labor and money through group purchasing and handling . . . you create lasting goodwill impressions on your customers, prospects or employees . . . all for the modest $6.50 price.

Fact is, leading executives have said that the Gift-Bookard is the most important new idea for solving the problems inherent in obligatory gift giving to come along in many a year.

The next move is yours. If you'd like to see a sample Gift-Bookard, fill in the coupon below and mail to us — no obligation of course. Or . . . possibly you can refer this ad to someone in your company who might be interested.

IMPORTANT FACTS TO KNOW . . .

The U. S. Senate, in an effort to close "loopholes" in existing tax laws, has recommended a clampdown on tax exemptions for business expenses. The amendment would LIMIT DEDUCTIBLE GIFTS TO A $10 VALUATION. (This excerpt is from Page 1 of the New York *Herald Tribune* of June 21, 1960.)

Gallery of Gifts, Inc., 80 Park Ave., N. Y. 16, N. Y.

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Gentlemen:
We use approx._____gifts each year in the $6.50 price range. Please send sample of your Gift-Bookard to us. We understand there is no obligation.

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For more facts, use coupon or Request Card at page 18 and circle No. 337

Asphalt handbook in revised edition

■ A revised edition of "The Asphalt Handbook," a standard reference, has been published by The Asphalt Institute. The handbook, first issued in 1923 as the "Asphalt Pocket Reference for Highway Engineers," was last revised in 1947.

Among the subjects taken up are uses of asphalt; terms relating to asphalt and its uses; tests, specifications and principal recommendations; thickness of asphalt-pavement design; construction of asphalt pavements; equipment used in paving work; stage construction, reconstruction, and maintenance; asphalt surfaces on bridges; railroad usage; parking areas and driveways; and miscellaneous information and tables. Illustrations supplement the text. Appendixes and an index complete the 398-page hard-cover book.

Copies are available, without charge, from The Asphalt Institute's division offices: 1270 Avenue of the Americas, New York 20, N. Y.; Bell House, Columbus 15, Ohio; 1951 University Ave., St. Paul 4, Minn.; 2707 Meadows Bldg., Dallas 6, Texas; and 810 University Ave., Berkeley 10, Calif.

Construction, maintenance of bridges in HRB books

■ Two bulletins on bridges have been issued by the Highway Research Board, 2101 Constitution Ave., Washington, D. C.

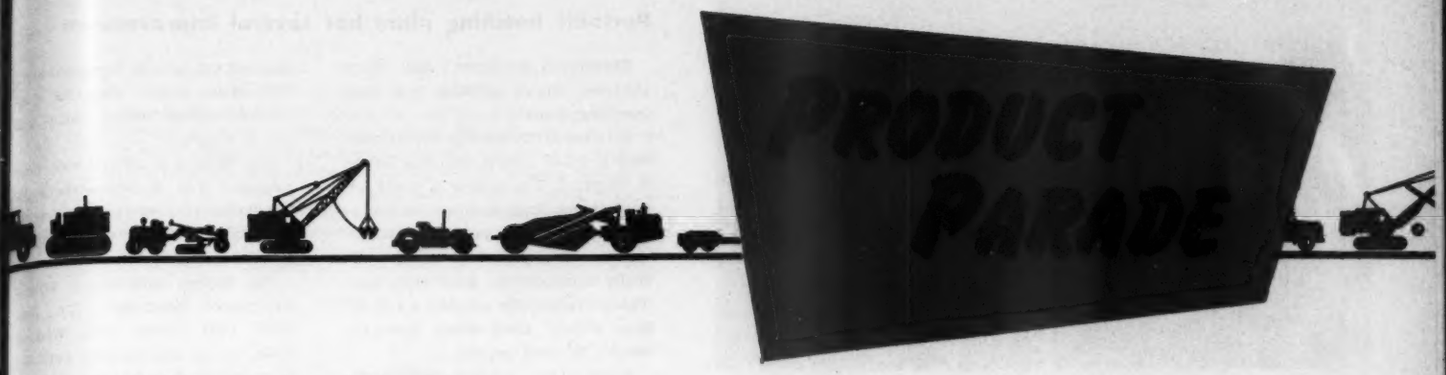
"Bridges: Bearing Pads, Foundations, Scour, and Waterways," has papers dealing with elastomeric bridge bearings; tests of steel tubular piles driven near Saigon River, Vietnam; a rational method for determining safe foundation pressures and embankment stability; the use of backwater in designing bridge waterways; and laboratory observation of scour at bridge abutments. This bulletin, No. 242, is priced at $1.40.

The second bulletin, No. 243, "Highway Bridges: Painting and Deck Construction," contains two papers. One contains a check list of things to avoid in painting highway bridges, along with some special considerations for such work. The other paper covers some of the distinctions made in the construction of concrete bridge decks and the construction of concrete pavement on grade. This bulletin costs 60 cents.

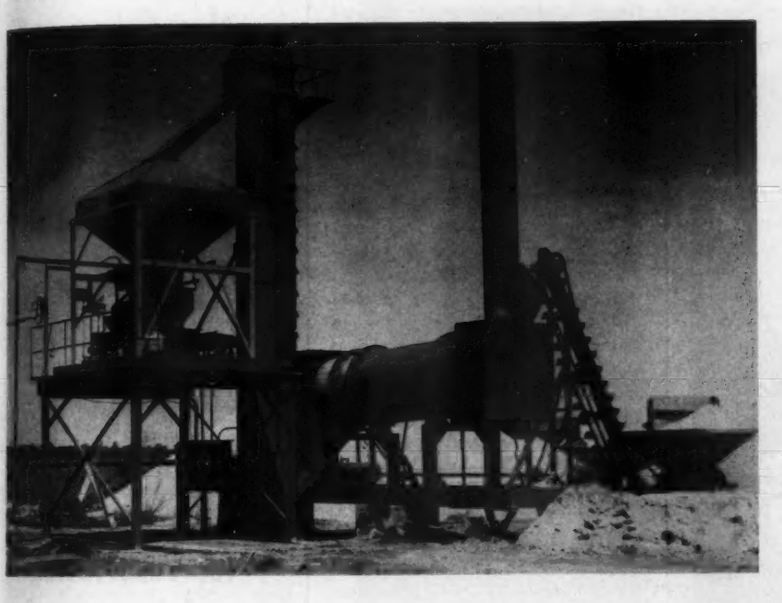
U. S. firm to plan rebuilding of Agadir

■ The United States International Cooperation Administration has engaged the city-planning consulting firm of Harland Bartholomew & Associates, St. Louis, Mo., to prepare a master plan for the rehabilitation and reconstruction of the city of Agadir, Morocco.

Agadir was devastated by an earthquake in February, 1960. Scheduled for early construction are housing projects, a hospital, administrative building, market, mosque, and radio station.



For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.



New asphalt plants rated 30 to 50 tph

Two new units have been added to the White Mfg. Co. line of asphalt plants.

The Models L-301B and L-501 are similar in design. The L-301B is rated at 1,500 pounds per batch, and the L-501 at 2,000 pounds per batch. Hot-mix can be produced at the rate of 30 to 50 tph, the manufacturer states.

Available accessories include aggregate and asphalt scales, dust collector and exhauster, and asphalt pump and meter.

The new plants feature air-operated controls with air supplied from a built-in compressor, extra-large storage bin, extra-large dryer for more capacity with wet materials, and bigger burner and blower combinations. Greater capacity at lower cost per ton is said to be achieved with the two new plants.

For further information write to the White Mfg. Co., Dept. C&E, 1227 W. Beardsley Ave., Elkhart, Ind., or use the Request Card at page 18. Circle No. 35.

Tractor-drawn roller has 50-ton capacity

A tractor-drawn pneumatic-tire roller designed to give more than 50 tons of packing power is now available from the Koehring California Co.

Called the Konsolidator, the unit is said to be perfectly balanced for tractor traction and to be able to roll down a course at speeds up to 10 mph.

The new unit weighs 37,000 pounds empty and 115,000 pounds when fully loaded. The body has 700 cubic feet of space for sand ballast, and the towing frame has 130 cubic feet of space for water ballast.

The Konsolidator is about 29 feet long, 12 feet wide, and 10 feet high, and has 18.00 x 25, 20-ply tires. According to the manufacturer, the unit puts 100,000 pounds pressure on the tires, plus 15,000 pounds pressure on the tractor.

For further information write to Koehring California Co., division of Koehring Co., Dept. C&E, P. O. Box 1891, Stockton, Calif., or use the Request Card at page 18. Circle No. 57.

Towing height of the Nomad plant is 12 feet 2 inches. The unit can be optionally furnished with a fifth-wheel striker plate for towing by tractor.

Portable batching plant has several improvements

Engineered Equipment, Inc., offers the new Nomad portable aggregate batching plant.

A full 6-yard-capacity hopper with only a 9-foot 2-inch charging height is standard. The hopper is easily accessible for front-end-loader charging as there is no protruding frame.

Main transportation trucks are easily retractable for quick setup time. This automatically provides a full 12-foot 6-inch truck-mixer charging height on level ground.

Front-wheel assembly features automotive-type steering. As an option, the unit can also be furnished with a fifth-wheel striker plate for truck-tractor towing. Towing height is 12 feet 2 inches.

The Nomad is offered with either standard dial or beam-type scales. Decumulative Conveyex-type weighing is also available with a compartmentized weigh batcher.

For further information write to Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa, or use the Request Card that is bound in at page 18 of this issue. Circle No. 39.

Offer one-piece tandem ripping push block

A one-piece tandem ripping push block, which transmits the force of the push tractor directly to the ripper shank and thereby minimizes bending forces on the shank, has been announced by the Caterpillar Tractor Co. for both the No. 8 and No. 9 rippers.

The push block is mounted on the rear of the 5-position clevis equipped with a straight shank. It is pinned at the top through the rear clevis pin hole and requires neither welding nor cutting for installation.

In operation, the blade of the second tractor is placed in the V formed at the junction of the vertical block and a horizontal plate. The block extends below the plate and contacts the rear of the ripper shank at a point nearly at ground level.

By keeping the point of contact so low to the ground and by eliminating the transmission of pushing force through the clevis, pins, and beam, the ripper shank is subjected to much less bending force, the manufacturer points out.

The push block is also of aid in single-tractor ripping work since the 1,350-pound weight helps hold the shank in the ground.

For further information write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 45.

Powerful chain saws offered in eight models

A new line of chain saws is announced by the Homelite Division of Textron, Inc.

Features include a substantially more powerful engine, an all-position diaphragm carburetor, automatic clutch, and simple piston-pump oiling. A full line of attachments is available, including a 16-inch plunge-cut bow, clearing bar, and brush cutter.

One of the eight models available, the Model 900-G, is designed for felling trees up to 10 feet in diameter.

For further information write to Textron, Inc., Homelite Division, Dept. C&E, 71 Riverdale Ave., Port Chester, N. Y., or use the Request Card at page 18. Circle No. 94.

BUILT TO DIG!

Constant digging power throughout the digging cycle.
Wide head, upright bars for greatest digging power.
Correctly shaped scoops have no interior angles or projections; assure smooth, fast dumping.
Full complement of five sheaves for fullest digging power, readily adjustable to any lesser parts of line.
Weight concentrated at lower block for quickest opening and greatest digging power.
Brackets over-hang to assure maximum power.
Independent (double) hinge suspension, scoops can dig individually.
Contact type bumpers eliminate friction in starting digging cycle.

WILLIAMS BUCKETS

Durable clamshell and dragline buckets for every application

Williams Bucket Division, The Wellman Engineering Company, 113 St. Clair Ave. N.E., Cleveland 14, Ohio

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SWENSON the Summer-Winter Spreader...

U. S. Army Photograph

for resurfacing and ice control

Spread sand, gravel, salt, calcium chloride, cinders or any combination of these materials. Clutch-controlled from cab of truck. Any desired rate-of-flow. Steady or intermittent up to 30 M.P.H. Narrow strips or full traffic lanes. Forward or reverse. Models to fit any dump-truck box. Chain or hydraulic drive. Speed summer construction jobs, dust control, soil stabilization. Handle winter ice-control problems faster, safer, more efficiently. Write for complete information.

For more facts, circle No. 339

This rig working for R. H. Wright, Inc., Fort Lauderdale, Fla., is one of a team of four Travelift mobile hydraulic lift-and-carry units owned by the company. The 25-ton A-frame model is being used to place concrete for prestressed members on a highway job at Krotz Springs, La. The rig is also used to lift the cured beams from the forms, stockpile them, or load them for delivery to the job site. For further information write to **Travelift & Engineering, Inc.**, Sturgeon Bay, Wis., or use the Request Card at page 18. Circle No. 129.

Crane for truck mounting is compact and versatile

The Focowil Corp. announces the Foco-Crane Model F-6600ZX, an all-hydraulic jib-boom type of crane for truck mounting, with design features said to enable the operator alone to load and unload almost anything, in bulk or in units up to 3.3 tons, on open-bed trucks and trailers.

The elimination of gears, running cables, pulleys, winch, and similar wear components is made possible by a fully articulated boom that elevates, depresses, turns, telescopes, and "elbows." The crane pillar is side-mounted for maximum reach and strength with minimum weight.

The boom folds and telescopes into a 15-inch space athwart the truck channels for travel. In this position, the crane's center of gravity is centered on the truck and is only about 6 inches above the platform. Two hydraulic support legs reduce frame stress and prevent tipping during operation.

The standard crane features dual controls. Maximum lifting height is 24 feet; maximum depression is 4 feet 5 inches below ground level; maximum reach from center of truck is 17 feet; swing angle is 280 degrees; and weight installed is about 1,900 pounds. Lifting capacity is 2,200 pounds at maximum reach and up to 6,600 pounds on short boom. Safety valves prevent overloading.

For further information write to the Focowil Corp., Dept. C&E, 79 W. Monroe St., Chicago 3, Ill., or use the Request Card at page 18. Circle No. 17.

Machine tests ductility of bituminous materials

The Model AP-101 ductility machine for testing the ductility of bituminous materials is offered by Soiltest, Inc.

The test apparatus, most parts of which are stainless steel, is mounted in a double-wall polished stainless steel bath that is 80 inches long, 12 inches wide, and 12¾ inches deep. The entire tester machine can be mounted on a standard laboratory bench or table.

For further information write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 43.

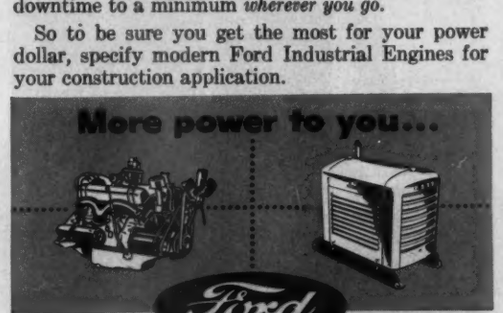
Ford-powered roller provides smooth, steady 14-ton *"squeeze"* for road binding operation!

Whatever the material—crushed stone, soil cement, or blacktop—the Ford-powered Austin-Western 3-wheel roller is built to make short work of any compacting job. And just as Ford power contributes to the effectiveness of the Austin-Western roller, a Ford Industrial Engine can bring a new kind of efficiency to your construction equipment.

Ranging from 134 to 534 cubic inches, Ford engines offer a host of modern durability features such as Short Stroke design to reduce friction and wear . . . Deep-Block construction for smoother performance . . . and full length water jackets for better cooling and longer engine life. With features like these, Ford engines now give you *more horsepower per pound of engine weight than ever before possible.*

All Ford engines, including Ford's two highly economical diesels, are available as complete assemblies or power units. Because these engines can be serviced by any nearby Ford Dealer, you can keep downtime to a minimum *wherever you go.*

So to be sure you get the most for your power dollar, specify modern Ford Industrial Engines for your construction application.



FORD POWER IS RIGHT FOR YOUR EQUIPMENT, TOO!

INDUSTRIAL ENGINE DEPARTMENT, FORD DIVISION, FORD MOTOR CO., P.O. BOX 598, DEARBORN, MICH.

West of Rockies write to: FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 6787, LOS ANGELES 22, CALIF. / FORD INDUSTRIAL ENGINE DEPT., P.O. BOX 1666, RICHMOND, CALIF.

For more facts, use Request Card at page 18 and circle No. 340

For more facts on Insert, use Request Card at page 18 and check No. 343

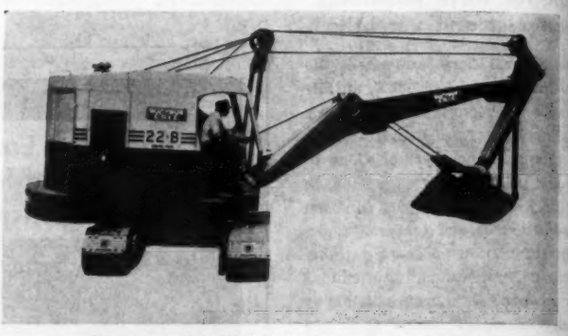
Placing 65 cubic yards of concrete per hour, this finishing machine was used by a combine of Rusciano and Del Balso Construction Corp., Pelham Manor, N. Y., on the recently completed White Plains section of the Cross Westchester Expressway in New York. The Blaw-Knox machine, equipped with four screed speeds and five forward traction speeds, is shown making a 12-foot-wide pass while riding on 9-inch-high B-K road forms. This $13½ million, 4.26-mile-long section consists of two 37-foot-wide reinforced-concrete lanes divided by a 12-foot-wide center mall. When the Rye and Elmsford sections are completed, the roadway will provide a direct link between the New England and New York Thruways. For further information write to the **Blaw-Knox Co., Construction Equipment Division,** Dept. C&E, Mattoon, Ill., or use the card at page 18. Circle No. 130.

New crane-excavator has 25-ton capacity

The Bucyrus-Erie Co. announces the 22-B Series Two crane-excavator. It is available as a crawler, carrier, or wagon-mounted machine, fully convertible for crane, dragline, clamshell, hoe, or shovel service.

On the 25-ton-capacity machine, important features include: high-strength alloy-steel booms up to 110 feet long with bolt or pin connections; choice of 6 × 4, 6 × 6, 8 × 4 carriers with gas or diesel power; removable rear outriggers, plus optional aluminum floats for jack screws on outrigger beams; and power load lowering. Hydraulic outriggers with both horizontal and vertical movement are available.

For further information write to the Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 78.



The Bucyrus-Erie 22-B Series Two crane-excavator.

SIMPLICITY
in the Heart of the Modern Diesel Engine

Simple—Only 8" long, 3¼" wide, 5¼" high . . . weighs less than 10 pounds . . . fewer parts to service, fewer adjustments to make.

Versatile—Because of accessories that can be built in or added at low cost taking up no, or very little, valuable engine block space.

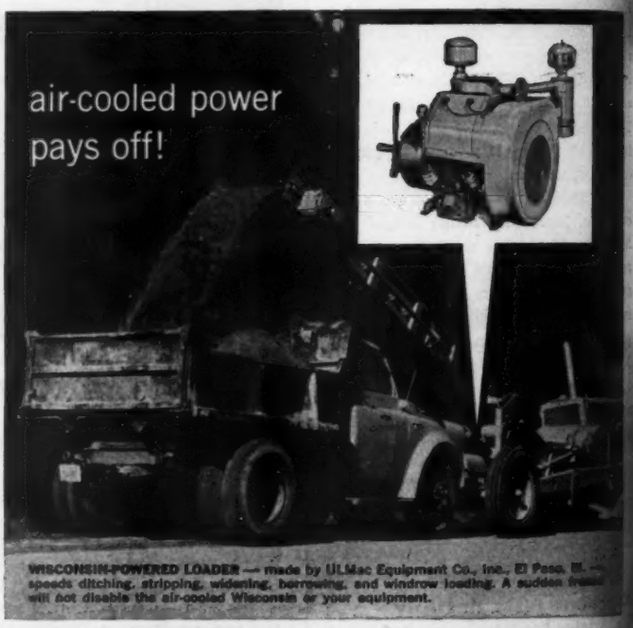
Economical—Initial cost is less, costs less to service, saves money because of its dependable service.

HMS
ROOSA MASTER

Write for guides to better fuel injection. One features the pump, the other an efficient, economical filter.

HARTFORD MACHINE SCREW CO., HARTFORD 2, CONN.
Division of Standard Screw Company

For more facts, use Request Card at page 18 and circle No. 341



WISCONSIN-POWERED LOADER — made by ULMac Equipment Co., Inc., El Paso, Tex. — speeds ditching, stripping, widening, borrowing, and windrow loading. A sudden freeze will not disable the air-cooled Wisconsin or your equipment.

56-hp WISCONSIN ENGINE

loads 15 cu. yds. min.—slashes upkeep

The 56-hp air-cooled Wisconsin offers you king-size power and economy. Its rugged all-weather dependability enables equipment like this ULMac loader to earn its keep — *and more!*

The husky Wisconsin has no radiator, water pump, fan belt, or other water-cooling frills to run up cost and upkeep. There's no water to haul — no anti-freeze to buy — and no conditioning routine for winter and summer use.

The Wisconsin is precision-fitted for long life. Its high torque pulls the engine through shock loads without stalling — keeps your job on schedule.

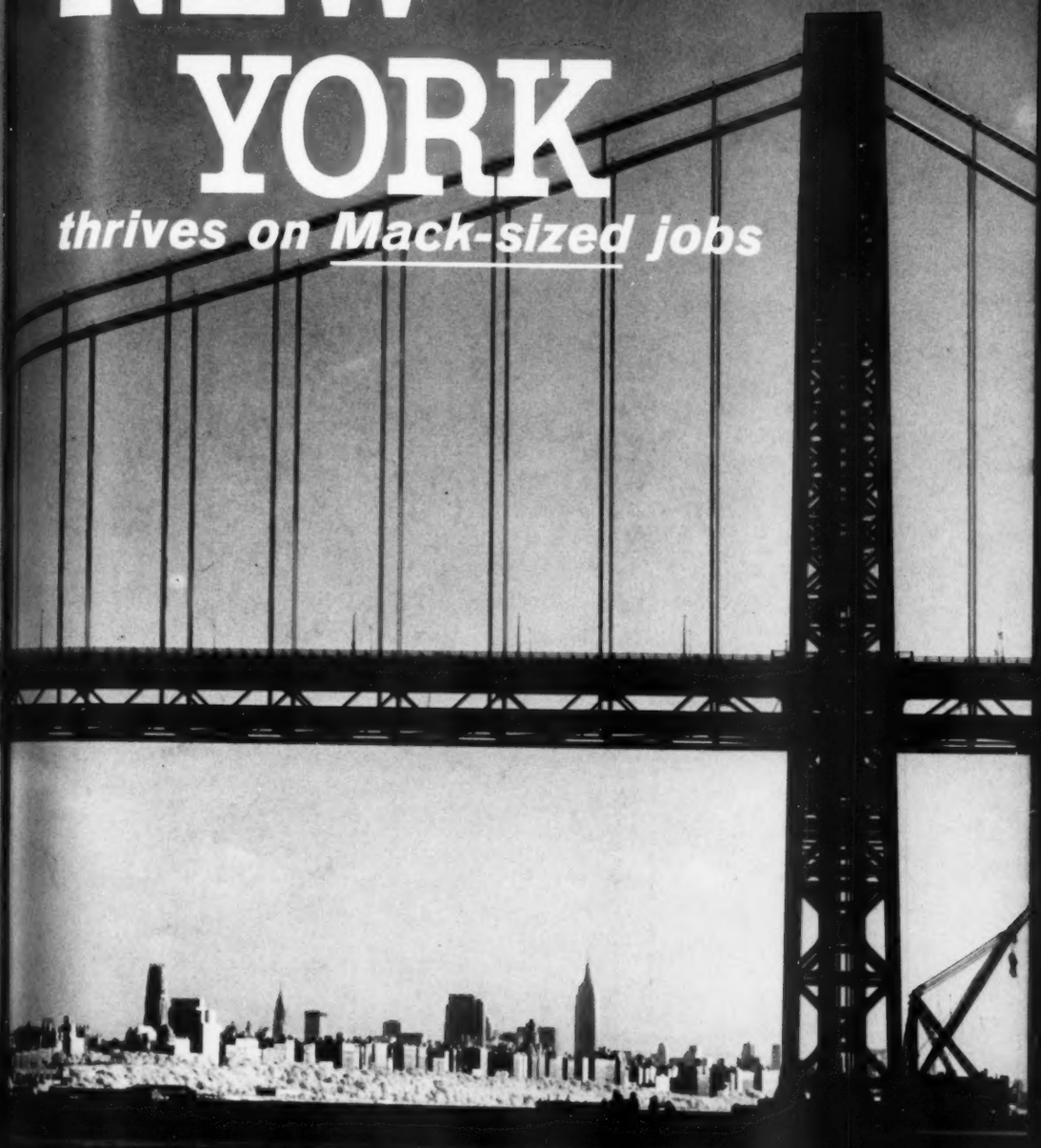
Power your equipment with air-cooled Wisconsin Engines — 3 to 56 hp. Send for Bulletin S-251. Write to Dept. C-20.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

For more facts, use Request Card at page 18 and circle No. 342

NEW YORK

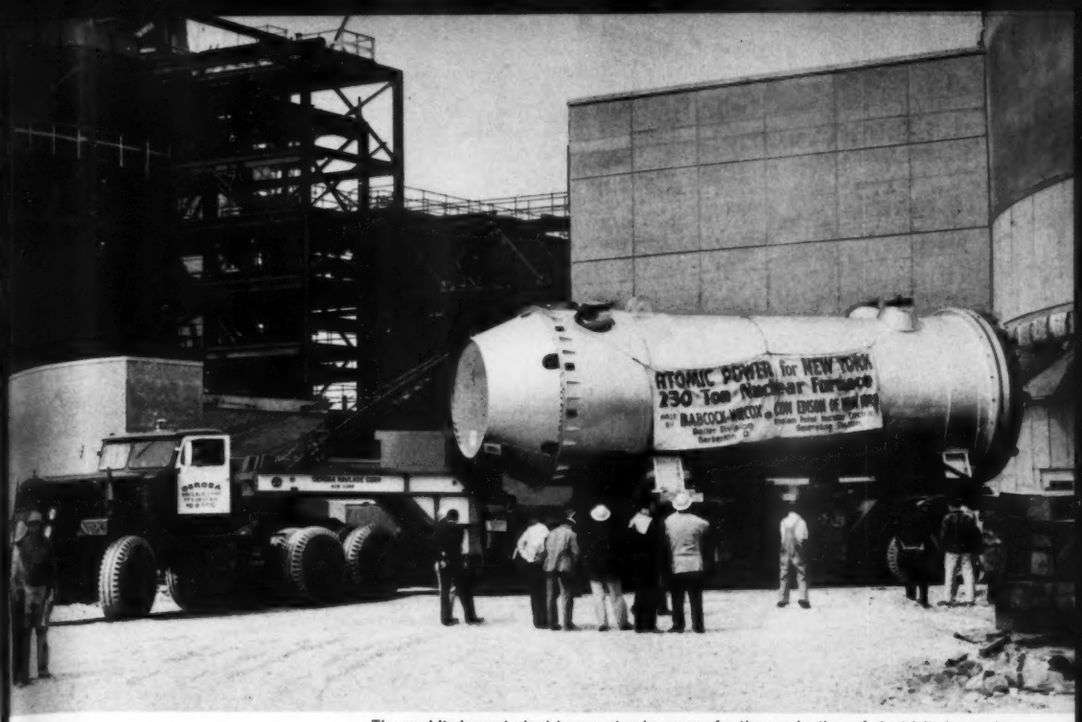
thrives on Mack-sized jobs



...ge decking the George Washington Bridge

M. J. Torpey, Inc., digs into New York's bedrock to prepare the new Manhattan approach to the George Washington Bridge. Mack dumpers are favorites on this kind of rock job because of their ability to take the day-in, day-out pounding under the shovel and because they have the power and traction for the steep pit pullouts.

The Big City



The world's largest plant to use atomic energy for the production of electricity is nearing completion at Indian Point, a short way up the Hudson from New York City. Consolidated Edison Co. relies on Gerosa Haulage for the experience and know-how to handle heavy tonnage units . . . and Gerosa relies on Macks. Big Mack in picture is hauling the 230-ton nuclear furnace.

keeps growing bigger...

East side, west side, all around the town . . . New York keeps digging, building, growing. Giant new buildings plug the gaps in the skyline—new expressways are carved into the suburbs—a hanging highway crosses the Hudson suspended below a great bridge.

Wherever you turn in New York, the city teems with building activity—and with Mack trucks. Why so many Macks on these jobs? There are plenty of good reasons. For instance, Mack makes a truck that gets jobs done—not just when the going's good, but under *all* conditions. Not just when it's new, but long after other so-called heavy-duty vehicles have outlived their usefulness. A Mack truck can do this because of Mack Balanced Design . . . the exclusive Mack practice of building its own quality components. Built for Mack trucks alone, they work together with unequaled efficiency and longest life.

Time and again experienced operators have solved the problem of high truck operating costs by turning to quality Mack equipment. Whether to increase your hauling capacity or to take on an unusually tough assignment, there's a Mack model ready to help put more profit in your operation. Your local Mack branch or distributor is the man to see.

and Bigger...

Hands at the construction of the new expressways smoothing travel between New York City and its expanding suburbs, Tully & Dinapoli, Inc., works its big Mack fleet on numerous jobs throughout the Metropolitan area.

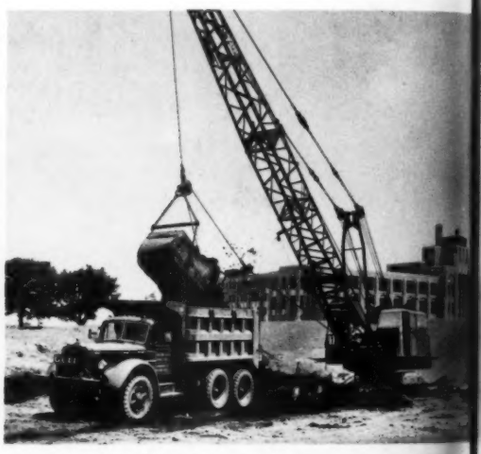
OVER AND UNDER: Mounting traffic problems of New York's northern approaches mean large-scale alterations to Bruckner Blvd. Round-the-clock operations by the Mack fleet of Slattery Contracting Co., Inc., helped keep the big job on schedule.

MORE POWER TO N. Y.: Growth of Manhattan's east side brought the need for more power. Thousands of tons of rock were hauled by the Macks of Poirier & McLane Corporation during the construction of this giant generating plant of the Consolidated Edison Co.

and Bigger!

with MACKS

NEW BOTTOM: 100,000 motorists a day cross the George Washington Bridge—often get jammed up on it. To help relieve these jams, a new six-lane roadway is being suspended below the existing bridge. Geo. M. Brewster & Son, Inc., one of the major firms at work on the multi-million dollar project, uses Macks on its heavy-duty jobs.



BUILDUP FOR EDUCATION: Handsome new educational facilities at St. John's University will help take care of New York's ever-growing student population. Gull Contracting Co., Inc., flattens acres of land for new athletic fields with the help of dependable, economical big capacity Mack dumpers.

MACK FIRST NAME FOR **TRUCKS**

Mack Trucks, Inc., Plainfield, New Jersey. Mack Trucks of Canada, Ltd., Toronto, Ontario

MACK for over 7 straight years NO.1 by far in sales of diesel trucks

Printed in U.S.A.

Use of the new Concrete Transport mixer is said to permit production in excess of 1,100 square feet per hour with a 5-man crew.

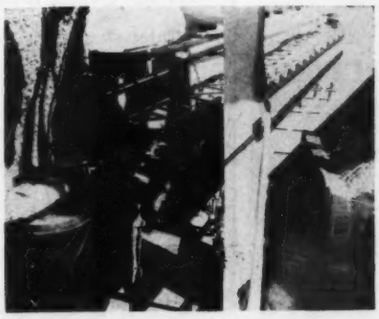
Announce new mixer for roof-deck concrete

A new machine for mixing lightweight concrete for roof-deck applicators is available from the Concrete Transport Mixer Co.

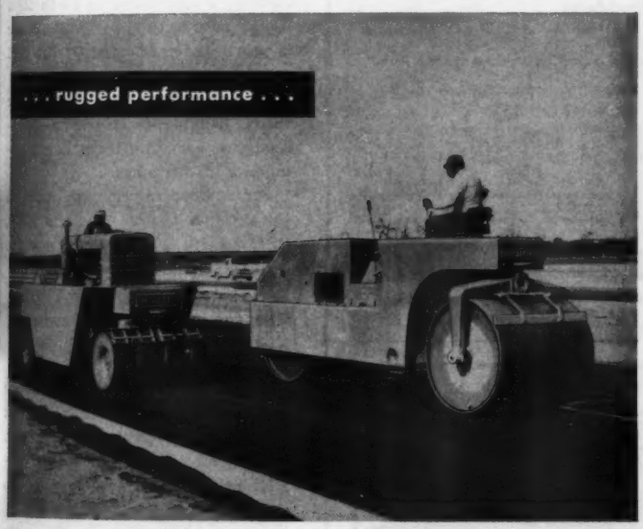
This compact mixer has a Moyno pump built into it. It can take the ingredients at ground level with a minimum of labor and discharge the mixed concrete on the roof through a hose in heights up to 20 feet at 250 feet on the horizontal.

The bucket lift, bucket door, and discharge gate are all hydraulically controlled. Engine clutch levers and hydraulic valves are controlled from the operator's platform. The mixer and pump are each driven by a Wisconsin engine, and water is controlled by a Neptune Auto-Stop meter.

For further information write to the Concrete Transport Mixer Co., Dept. C&E, 4985 Fyler Ave., St. Louis 39, Mo., or use the Request Card at page 18. Circle No. 103.



The cleated surface of this special 24-inch conveyor belt allows efficient handling of rock and gravel with high water content at the Serv-Tex Materials Co., New Braunfels, Texas. The chevron-cleated Manhattan conveyor belt is so constructed that the cleats overlap, permitting smooth running over return idlers. The 4-ply belt, with its extremely tough yet flexible nylon-ply construction, replaces a smooth belt that could not transport the stone and water mixture up the steep slope and also limited the amount of water that could be added to the mixture. The chevron-shaped cleats or ribs of the Manhattan belt provide many small pockets to trap the water so it won't flow freely. For further information write to **Raybestos-Manhattan, Inc.**, Manhattan Rubber Division, Dept. C&E, 61 Willett St., Passaic, N. J., or use the Request Card at page 18. Circle No. 8.



Proven by contractors with compacting problems

Ingram Rollers continue to prove their ability to overcome modern compaction problems to the construction industry. Backed by 30 years of outstanding engineering experience, **Ingram Rollers** provide rugged performance with minimum maintenance. Shown above is the **Ingram** 12 ton 9-wheel pneumatic roller working with an **Ingram** 8-12 ton tandem roller.

INGRAM ROLLERS

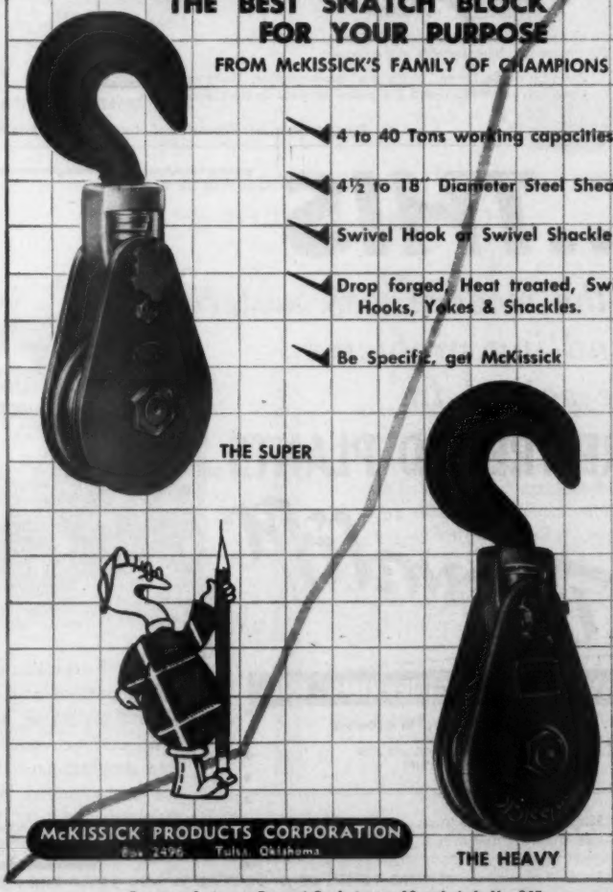
Two-Axle Tandem Rollers 3-Wheel Rollers
9-Wheel Pneumatic Rollers
AVAILABLE IN ALL SIZES

Acme IRON WORKS
CULEBRA AVE. AT EXPRESSWAY N. W.
P.O. BOX 2020 • SAN ANTONIO 6, TEXAS

For more facts, use Request Card at page 18 and circle No. 344

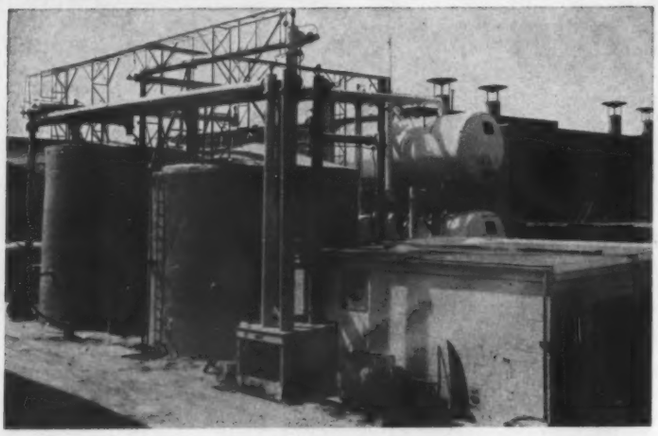
THE TREND IS UP when you use McKISSICK
THE BEST SNATCH BLOCK FOR YOUR PURPOSE
FROM McKISSICK'S FAMILY OF CHAMPIONS

- 4 to 40 Tons working capacities
- 4½ to 18" Diameter Steel Sheaves
- Swivel Hook or Swivel Shackle
- Drop forged, Heat treated, Swivel Hooks, Yokes & Shackles.
- Be Specific, get McKissick



McKISSICK PRODUCTS CORPORATION
Box 2496 Tulsa, Oklahoma

For more facts, use Request Card at page 18 and circle No. 345



Electric heaters keep asphalt at controlled temperatures in a fully automatic plant recently completed by the Sicilian Asphalt Paving Co., of Brooklyn, N. Y. Tanks and pump room are shown here. Internal heating elements deliver all heat directly to the asphalt without waste. The low watt density of the heating elements, plus thermostat control, prevent coking due to hot spots or high surface temperatures. The heating elements are designed for easy removal through terminal boxes without disruption to the system. The plant has a capacity of 2,000 tons per 10-hour day. For further information about these heating elements write to the **Hynes Electric Heating Co.**, Dept C&E., Mountainside, N. J., or use the Request Card at page 18. Circle No. 112.

"Hardrock Smitty" says:— **IT TAKES A SMITH 125 AIR COMPRESSOR TO DELIVER ON THE TOUGH JOBS . . .**

Built to "take it" when the going get tough, the Smith 125 Air Compressor will give you years of low cost, dependable service. The Rugged Hercules Industrial engine delivers over 125 c.f.m. hour after hour, day in and day out.

LOOK AT THESE FEATURES:

- low initial cost
- low operating cost
- easy maintenance
- simple, compact design
- 12 volt electrical system
- 125 c.f.m. at 1165 rpm
- operates two 85 lb. paving breakers at same time

Compare price . . . compare job results—you'll "Go Smith" with "Hardrock Smitty"!

SMITH AIR COMPRESSORS

GORDON SMITH & COMPANY, INC., Bowling Green, Ky.

There's also a complete line of Smith Air Compressors in 45 cfm and 75 cfm models, both portable and stationary.

Ask your dealer for an "on the job" demonstration. (write us for complete information and the name of your nearest dealer.)

For more facts, use Request Card at page 18 and circle No. 346

Three drills available for hard-rock drilling

Three sizes of the versatile Mole-Dril are now offered by the Gardner-Denver Co. Ranging from 4 to 6 inches in diameter, the Models AM4, AM5, and AM6 are designed for hard-rock drilling in construction and quarry operations.

The percussion-type Mole-Dril screws right onto the drill pipe and works at the bottom of the hole directly on the rock face. There is no power loss between the hammer and the bit, regardless of drilling depth, states the manufacturer. Positive hole cleaning is maintained by air through the air tube to the bit. Additional air is provided for cleaning by the drill exhaust ports.

With only three moving parts—the valve, hammer, and piston—disassembly is easy and there is a minimum of maintenance.

For further information write to the Gardner-Denver Co., Dept. C&E, S. Front St., Quincy, Ill., or use the card at page 18. Circle No. 50.

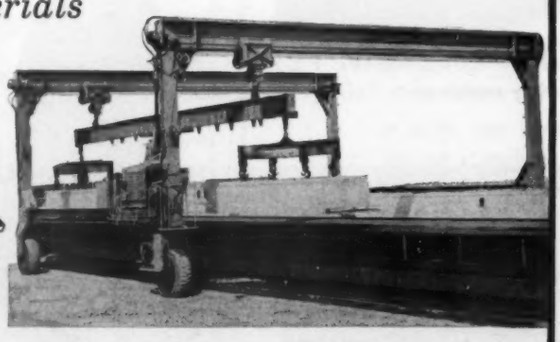
...THIS

is the modern way materials handling problems are solved in

PRESTRESSED PLANTS

Travelift

Travelift offers the fastest, safest method of stacking or loading girders.



This free-traveling vertical lift carrier steps up the entire pace of your operations. Use Travelift to pull strand, set forms, pour forms, clear beds, store finished beams. Maneuverability excellent. Steering, lifting and propulsion of the *Self-Propelled* Travelift are by hydraulics. Available in 6 models with Capacities of 7, 12, 25 and 30 tons or can be custom built to meet your requirements.

TRAVELIFT & ENGINEERING, INC.

Dept. CE, Sturgeon Bay, Wisconsin

☐ Please send information on the SELF-PROPELLED TRAVELIFT

NAME_____

ADDRESS_____

CITY_____ STATE_____

BE SURE TO SEE US IN BOOTHS 51 AND 52 AT THE P.C.I. CONVENTION

For more facts, use coupon or Request Card at page 18 and circle No. 347

Plaster and mortar mixer holds 5½ cubic feet

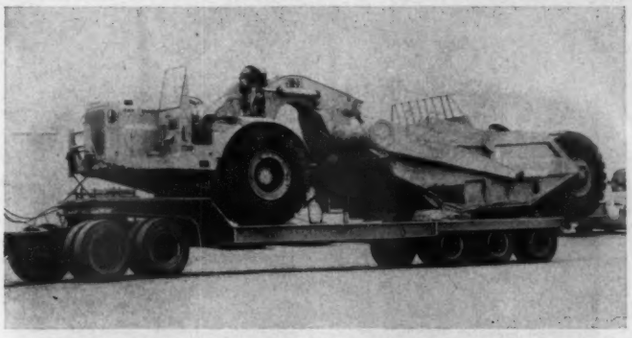
The Muller Machinery Co., Inc., has added a new, improved 5½-cubic-foot plaster and mortar mixer to its line.

The unit has lifetime-sealed self-aligning bearings that require no greasing.

Another feature is a new engine housing that is split and hinged for accessibility and ventilation.

For further information write to the Muller Machinery Co., Inc., Dept. C&E, P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 99.

The LaCrosse Model DF3T is available in 30, 40, and 50-ton models.



Low-bed trailer features single-point suspension

A new 3-axle heavy-duty low-bed trailer is announced by the LaCrosse Trailer Corp.

Designated Model DF3T, the unit features single-point suspension design, to assure equal load distribution on each axle, regardless of where the load is placed on the trailer bed. Offered in 30, 40, and 50-ton models, the trailer is available with either 15 or 20-inch wheels for maximum long haul service. All models are available with drop or flat platforms.

For further information write to the LaCrosse Trailer Corp., Dept. C&E, 418 Gould St., Box 857, LaCrosse, Wis., or use the Request Card at page 18.

Vibrating earth borer tunnels under pavements

A machine for making cross holes beneath roads, sidewalks, and driveways is offered by the Remington Arms Co., Inc.

Called Model 14-EBW vibrating earth borer, the machine eliminates the need for excavating, pavement breaking, and resurfacing when laying a line, pipe, cable, or conduit underneath an existing structure.

Equipped with a 5-hp gasoline engine, the Model 14-EBW drives a special flexible shaft that rotates a vibrating eccentric inside the head of a specially pointed steel borer. Working at a rate of more than 10,000 vibrations per minute, the pointed borer noses its way through the earth, tunneling horizontally and making a 2-inch-diameter hole up to 28 feet long. No earth is removed during the operation; the boring head simply compacts the perimeter of the hole, squeezing its way underground through the extreme force of the mechanical vibration.

For further information write to the Remington Arms Co., Inc., Dept. C&E, 939 Barnum Ave., Bridgeport, Conn., or use the Request Card that is bound in at page 18 of this issue. Circle No. 64.

Electric chain saw is high-capacity unit

An electric chain saw said to perform comparably with high-powered gasoline chain saws is offered by Strunk Power for Modern Living, Inc., of Coatesville, Pa.

The unit's motor develops 7 horsepower, and all motor parts are built

for overcapacity. A centrifugal clutch on the motor allows for smooth and easy disengagement of the cutting chain; it automatically disengages the cutting chain when the motor is brought down to a speed at which it would overheat.

For further information write to Strunk Power for Modern Living, Inc., Dept. C&E, Coatesville, Pa., or use the Request Card that is bound in at page 18. Circle No. 93.

CYANAMID'S EXPLOSIVES REPRESENTATIVE HELPS YOU ON THE JOB!

By delivering the goods on time!

To make sure rock work keeps on schedule, Cyanamid's explosives representative sees to it that explosives arrive where you need 'em, when you need 'em!

He plans delivery for maximum safety and calls on Cyanamid's national network of plants and magazines to assure prompt delivery.

To further expedite delivery, your order is frequently stored ahead of time in a nearby distributing magazine. For large jobs, plant orders are made up in advance and held for shipment.

Current magazines include:

Belleville, Ill.; Berlin, Pa.; Brazil, Ind.; Denver, Colo.; Foster, Ohio; Great Bend, Kans.; Latrobe, Pa.; Odessa, Texas; Oklahoma City, Okla.; Riverton, Wyo.; Roundup, Mont.; Salt Lake City, Utah; Tulsa, Okla.

Don't forget Cyanamid's job-winning *Pre-Bid Service!*

By conducting a careful pre-bid investigation, Cyanamid's explosives representative offers contractors valuable assistance in estimating hard-rock blasting costs. Next time you bid on a hard-rock job, let an experienced Cyanamid explosives representative help you *get* and *do* the job!

CYANAMID

AMERICAN CYANAMID COMPANY
EXPLOSIVES AND MINING CHEMICALS DEPARTMENT
30 ROCKEFELLER PLAZA, NEW YORK 20, N.Y.

SALES OFFICES: Denver, Colorado • Maynard, Massachusetts • Kansas City, Missouri • St. Louis, Missouri • Albuquerque, New Mexico • New York, N.Y. • Tulsa, Oklahoma • Latrobe, Pennsylvania • Pottsville, Pennsylvania • Dallas, Texas • Salt Lake City, Utah • Bluefield, West Virginia
PLANTS: Latrobe, Pennsylvania • New Castle, Pennsylvania • Springville, Utah
PRODUCTS: High Explosives • Permissibles • Seismograph Explosives • Blasting Agents • Blasting Caps • Electric Blasting Caps • Blasting Accessories

For more facts, use Request Card at page 18 and circle No. 348

Corrugated aluminum culvert sheeting, available from the Kaiser Aluminum & Chemical Corp., can be readily cut with conventional hand and power saws at the installation site. The company points out that the sheeting is one-third the weight of steel and 1/35th the weight of concrete. For further information write to the **Kaiser Aluminum & Chemical Corp.,** Service Division, 1924 Broadway, Oakland, Calif., or use the Request Card at page 18. Circle No. 110.

Hard to reach places are easy for...

the powerful *Viberette*

in prestress work
in narrow forms

Hard-to-reach places and narrow stems of prestress T-sections are no longer a problem when the new Viberette Vibrator is on the job. It is designed especially for prestress and narrow form building construction.

The *12,000 rpm speed* and low amplitude of Viberette produces extremely effective vibration in consolidating low slump concrete.

A *small diameter* flexible drive with replaceable rubber tipped head makes it ideal for concrete compaction in constricted areas.

A *powerful,* universal ¾ HP electric motor gives Viberette plenty of "kick" for thorough vibration.

The 19 lb. Viberette Vibrator with new, dual grip, skid type handle makes the entire unit easy for one man to operate. A new shoulder strap attachment leaves both hands of operator free to manipulate the flexible drive.

Features

Interchangeable heads—1", 1-5/16" and 1-3/4" dia.
Flexible drive lengths—1' to 20'
Quick release drive connection
Replaceable rubber or steel tips

Contact your dealer or write direct for detailed information.
Viber Company, 726 South Flower Street
Burbank 32, California

VIBER CO **VIBRATORS**

Pioneers and leaders in the manufacture of vibrators.

For more facts, use Request Card at page 18 and circle No. 349

BIG

in QUALITY and ECONOMY

OWEN

OWEN clamshells are constructed with increased power and more durability foremost in mind. One of these features is the recessing of the top of each lip to receive the bowl plates. This gives the bucket a smooth interior and also relieves all stress and shear on the rivets that join the lips to the bowl plates. **Recessed lips are standard on all OWEN buckets —and at no additional cost!**

This is just one of the many reasons why OWEN Buckets are guaranteed pound for pound—size for size—to get a bigger load each bite—a larger output each day.

Write us your exact requirements. Remember, OWEN Engineers are at your service. Send for Free Catalog today.

The OWEN BUCKET Co.
BREAKWATER AVENUE, CLEVELAND 2, OHIO
BRANCHES New York • Philadelphia • Chicago
Berkeley, Calif. • Fort Lauderdale, Fla.

For more facts, use Request Card at page 18 and circle No. 350

New front-end loader digs with hydraulics

A new loader that scoops with hydraulics has been announced by A. C. Anderson, Inc., for mounting on International 340 and 460 tractors.

With the Power-Crowd, instead of ramming with the tractor, the bucket is pushed into the pile by heavy-duty hydraulic cylinders, while the tractor remains stationary.

Ample bucket clearance is provided for loading high-sided trucks or carriers. Design features make it possible to bring the tractor close to the truck, using the large tires as bumpers, while full bucket control allows self-cleaning dump action.

Making full use of the internal pump and reservoir in the tractor, the Power-Crowd loader reportedly assures quick response to the hydraulic controls under all conditions.

For further information write to A. C. Anderson, Inc., Dept. 208, Dept. C&E, P. O. Box 391, Wildwood, N. J., or use the Request Card at page 18. Circle No. 88.

Fully loaded bucket of the Power-Crowd is raised to full height without spilling. High bucket clearance offers efficient loading of even high-sided trucks.

New waterstop splicer for durable joints

A new waterstop splicer said to assure durable, watertight joints is offered by the Rubber & Plastics Compound Co.

Known as Nervastral Weldbar, it is designed for splicing all sizes of Nervastral waterstops, and is said to eliminate the problem of exactly matching nonuniform waterstop cross sections to assure full watertightness.

The manufacturer states that with one of the two sizes of Nervastral Weldbar, it is easy for unskilled labor to make all types of splices such as tee-joints, L-joints, butt splices, cross joints, or box joints.

For further information write to Rubber & Plastics Compound Co., Inc., Dept. C&E, Time & Life Bldg., Rockefeller Center, New York 20, N. Y., or use the Request Card at page 18. Circle No. 34.

This portable batching plant was erected to help in the manufacture of prestressed-concrete railroad crossties. The concrete had to meet the minimum compressive-strength requirements of 4,000 psi at time of initial prestress and 6,000 psi at 28 days. The Watco plant—transported from Plant City, Fla., to the job site of the American Concrete Crosstie Corp. in Tampa on three flat-bed trailers—was completely erected in two days. The production capacity of the plant is 1,000 units per day. For further information write to the **Plant City Steel Corp.**, Concrete Form Division, Dept. C&E, P. O. Box 1308, Plant City, Fla., or use the Request Card at page 18. Circle No. 105.

Project Superintendent, Jack Ryan, confers with Bridge Superintendent, T. Asack, whose vehicle is RCA 2-Way Radio equipped.

RCA 2-Way Radio Systems Help Campanella & Cardi to Beat Construction Deadlines!

—*Integrate Construction and Concrete Operations*

"We couldn't be without 2-Way Radio! You can't measure the value of RCA 2-Way Radio in our operation," says Julius Papitto, Equipment Manager, Campanella & Cardi, Hillsgrove, R.I. "There are so many savings effected they're almost impossible to enumerate!"

With two separate yet integrated systems—one for construction operations, the other for concrete—RCA Radio lets this progressive contractor expedite men and machines better, get jobs done more efficiently and on time or ahead of schedule. The firm depends on radio to keep in constant and instant touch with plants, projects, repair cars, mixer trucks on the road and key personnel and vehicles in the field. Matching company growth, radio equipment consists of six base stations, 75 mobile units, and is still growing!

For construction and ready-mix operations, RCA "LD" (Low Drain) Radio will prove itself and pay for itself quickly out of savings. Ask your RCA representative; or for complete descriptive literature write RCA, Communications Division, Dept. L-277, Building 15-1, Camden, N.J.

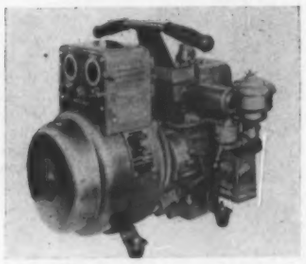
Mixer is alerted by 2-way radio to speed delivery to project.

You get dependability and economy with the new RCA "LD" Transistorized 2-Way Radio! Standard transistors used in circuits where long experience proves their reliability, where they do the best job in cutting down on costly battery drain. Priced considerably below other transistorized 2-way radios, comparable in cost to conventional tube-type radios—the "LD" is today's best buy in 2-way radio.

RCA The Most Trusted Name in Electronics
RADIO CORPORATION OF AMERICA

For more facts, use Request Card at page 18 and circle No. 351

New engine generator rated at 2,500 watts



The Wincharger Corp. has available a new engine generator with Maxi-Watt power control, designated Series 31B143S2D-F.

According to the manufacturer, the unit will carry a 2,500-watt load on a single 115-volt or 230-volt circuit, or will power motors up to 1½ or 2 horsepower.

These new engine generators are available in manual, electric, or remote start, and with a choice of four convenient mountings.

For further information write to the Wincharger Corp., a subsidiary of the Zenith Radio Corp., Dept. C&E, E. Seventh and Division Sts., Sioux City 2, Iowa, or use the Request Card at page 18, Circle No. 41.

Galion Allsteel's special trailer-body design eliminates the use of full-length longitudinals for added weight savings. Design features include completely boxed top rolls and integrated rub-rail design as compression members. The body's floor is corrugated for greater strength.

Light weight is feature of dump-trailer body

The Model XL dump-trailer body, designed for maximum legal payload with lightest possible empty weight, has been introduced by the Galion Allsteel Body Co.

The units are designed for use with full frames to provide stability and maintain the desirable high spill point for stockpiling and spreading operations since the base of the frame-type units remains constant throughout the dumping operation.

Available in standard lengths of [illegible] to 28 feet with a capacity range of [illegible] to 35 cubic yards, the Model XL can be used with any combination of axles depending on the existing state weight laws.

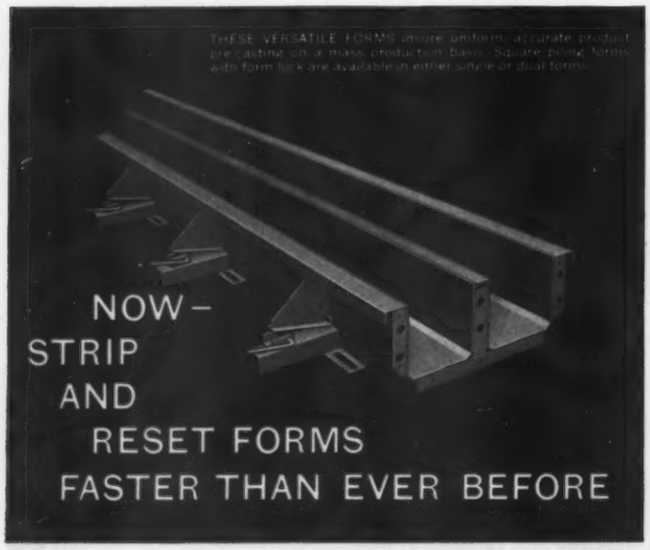
For further information write to the Galion Allsteel Body Co., Dept. C&E, Galion, Ohio, or use the Request Card at page 18. Circle No. 54.

Compound seals vertical and horizontal joints

W. R. Meadows, Inc., announces the availability of its new Sealtight CM-60 polysulfide-base joint-sealing compound.

Reported to provide a positive seal for both horizontal and vertical joints in masonry and concrete construction, Sealtight CM-60 is also said to maintain a positive bond up to 150 degrees F, and not to harden during application or cold flow after cure. The compound may be applied by trowel ing, pouring, or by gun application. It is furnished in black, gray, and [illegible] to blend with adjacent construction.

For further information write to W. R. Meadows, Inc., Dept. C&E, [illegible] Kimball St., Elgin, Ill., or use the Request Card that is bound in at page 18. Circle No. 49.

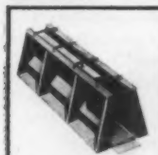

THESE VERSATILE FORMS insure uniform, accurate product precasting on a mass production basis. Square pedal forms with form lock are available in either single or dual forms.
NOW—
STRIP
AND
RESET FORMS
FASTER THAN EVER BEFORE

New 1960 Form-Crete forms feature more handling speed, easier stripping, longer service

Time is what you save when you cast prestressed members with FMC's new line of steel forms for 1960. Time in terms of faster stripping, faster resetting and fewer man hours per job. FMC has introduced many refinements to the pioneer line of steel forms, refinements that make them now, more than ever, the way to cast—at a profit. New form-lock for fast and perfect alignment, and new tilt back-designed forms for quick product removal are only a few of the features that make Form-Crete forms your best bet. Clip the coupon and get the full story from your local Form-Crete man.

FOOD MACHINERY AND CHEMICAL CORPORATION FC 260
Form-Crete Department – Lakeland, Florida FC12
Gentlemen: Please send me your latest catalog on Form-Crete forms.
NAME_____
ADDRESS_____
CITY_____ STATE_____

fmc FOOD MACHINERY AND CHEMICAL CORPORATION
Putting Ideas to Work
Form-Crete Department
General Sales Offices: Lakeland, Florida



FOR USE with any acceptable type of prestressing in current practice, the Form-Crete Bridge Beam form complies with joint P.C.I.—AASHO—recommendations. Form lengths in 10 foot sections, combinations up to 60 feet.

HOLLOW PILINGS are easily cast in these octagonal piling forms by use of tubing and piling headers. Unique tilt back design permits fast, easy product removal, cleaning and oiling of forms.

CHANNEL FORMS, with patented form-locks which allow sides to flex for quick and easy removal of product. Self-contained channel understructure insures extra rigidity and strength in this outstanding form.

FORM-CRETE LEDGER BEAM FORMS provide fast, accurate casting of roof support beams. Riser blocks can be employed to vary depth of beam; forms are lock-up type with reinforced self aligning pilot liners.

For more facts, use coupon or Request Card at page 18 and circle No. 352

Trenching Costs Only Pennies Per Foot with the ARPS TRENCH-DEVIL

Costs Less to Buy! — Costs Less to Operate! — Costs Less to Maintain!

LOOK . . .

★ **Speeds** up to 1200' per hour; depths — 1½' through 4½'; widths — 2¾" through 8".
★ **Power Boom Control** permits fast raising and lowering of boom for rapid trenching; depths are accurately controlled, eliminating guesswork.
★ **Reversible Dirt Conveyor** is standard equipment — deposits dirt at selected distance from either side of trench. In only 60 seconds, conveyor may be switched from one side to the other.
★ **Easy Transporting** — under its own power, the self-propelled Model MA-2 may be run up skids, into a pickup truck, or driven at 2¾ M.P.H. One man loads — transports — unloads — trenches.
★ **Smaller Model JR** Trench-Devil digs 2¾" or 3½" wide, up to 20" deep. Simple, one-man operation and fast — speeds of 15 feet per minute at a 12" depth.

Write today for full details on both models. Dept. C&E

ARPS CORPORATION
NEW HOLSTEIN, WIS.

TRENCHERS · HALF-TRACKS
BULLDOZERS · UTILITY

For more facts, use Request Card at page 18 and circle No. 353

Optional equipment for tractor shovel

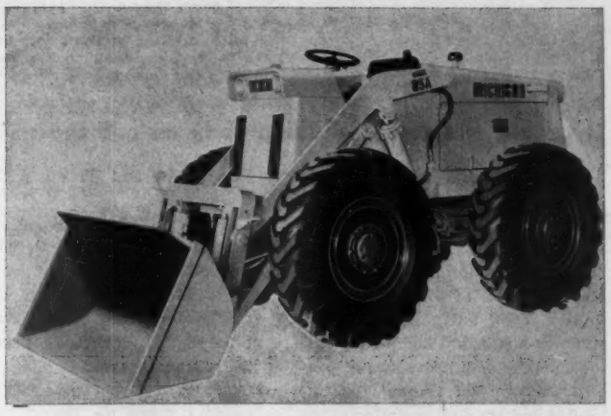
A 107-hp General Motors diesel engine, a range of bucket sizes, and three new attachments are now available as optional equipment for Michigan Model 85A tractor shovels.

The new diesel engine is the GM Model 5043. The Model 85A tractor shovel is also available with a Waukesha 96-hp gasoline engine or 91-hp diesel unit.

Equipped with a 1¾-cubic-yard standard excavating bucket, the Model 85A has a 9,000-pound lifting capacity. In addition to the standard bucket, optional buckets ranging in capacity from 1 yard to 2½ cubic yards are available for various materials.

The new attachments are a large-capacity rotary snowplow capable of handling up to 1,200 tons of snow per hour, a compact street sweeper that can be mounted in place of the bucket, and a hydraulic snap-mount backhoe that can be attached to the machine without the use of tools.

For further information write to the Clark Equipment Co., Construction Machinery Division, Dept. C&E, Pipestone Plant, P. O. Box 599, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 91.



The new options for Michigan Model 85A tractor shovels are designed to increase production, versatility, and ease of handling.

Turret derrick unit is versatile machine

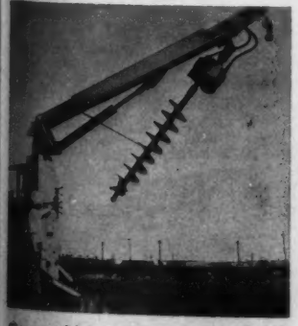
A new universal turret derrick unit with full 360-degree rotation, three mounting positions for line bodies, and optional equipment including hydraulic digger and 8,000-pound-capacity winch, is announced by the Truck Equipment Co.

Known as Model 8-TTD-30-U, the Truco unit will mount at right rear, left rear, or behind the cab in only 16 inches of space. All controls are unitized into the base, giving the operator full visibility and fast response of controls from one location. Smooth performance is achieved by full hydraulic action.

Box-type heavy-duty steel booms telescope in two sections to give a 21½-foot extended working radius through a 360-degree arc range. Maximum capacity is said to be rated safely at 8,000 pounds. Stability is achieved through hydraulic outriggers and jacks.

A special feature is the versatility of the hydraulic digger unit. The operator may stow and unstow the auger automatically and use the digger with either boom section. This makes possible maximum radius for digging holes, yet enables the operator to stow the digger with the main boom section while lifting and setting large utility poles with no danger to derrick, pole digger, or personnel. The derrick has a 30-foot sheave height.

For further information write to the Truck Equipment Co., Dept. C&E, 2963 Walnut St., Denver 5, Colo., or use the Request Card at page 18. Circle No. 46.



Operated by controls unitized into the base, the derrick's hydraulic digger may be stowed and unstowed automatically and may be used with either boom section.

MATCHED PERFORMANCE

To Save You Time and Work

The NAYLOR Wedgelock coupling makes a positive connection, securely anchored in standard weight grooved ends.

Take NAYLOR Spiralweld pipe . . . make connections with NAYLOR Wedgelock couplings . . . and you have a pipe line combination to save time, work and money.

Here's why! NAYLOR pipe is light in weight, so it's easier to handle and install. The distinctive NAYLOR lockseamed-spiralwelded structure makes it extra strong and safe in service.

You're ahead, too, when you use the Wedgelock coupling because it is designed for faster, easier, more economical make-up. A hammer is the only tool needed to connect or disconnect it.

For air, water and ventilating service, you can't beat the matched performance of this NAYLOR pipe and coupling combination. Write for Bulletin No. 59.

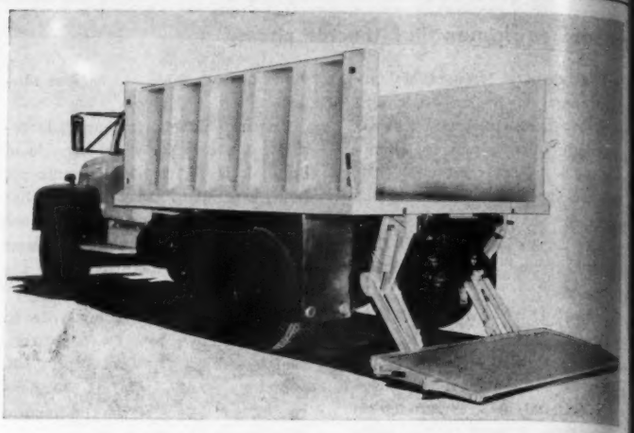
NAYLOR PIPE Company

1270 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 60 East 42nd Street, New York 17, N. Y.

For more facts, use Request Card at page 18 and circle No. 354

A latch locks the tail gate into the frame of the Power Gate, enabling it to function as a loading and unloading platform.



Hydraulic tail gate and dump body on one chassis

A dual-purpose combination dump-body and hydraulic tail-gate unit, known as Load N Dump, is announced by the Daybrook Hydraulic Division of the Young Spring & Wire Corp. Major features of the unit are said to be: (1) a tail gate that works either as a standard dump-body gate for dumping or a hydraulically powered platform for loading and unloading and (2) dual mounting of the Power Gate and the dump body on one chassis.

A 2-shaft power takeoff permits separate operation of either the Power Gate or the dump body.

For further information write to the Young Spring & Wire Corp., Daybrook Hydraulic Division, Dept. C&E, 500 Lehman Ave., Bowling Green, Ohio, or use the Request Card at page 18. Circle No. 109.

Joint-sealing compound offered in two forms

For the sealing of joints and cracks in concrete highways, A. C. Horn offers Horn-Tite, a bituminous material that will not flow or extrude in summer, or crack and pull away from joint walls in winter. Available in two forms—hot-poured and cold-applied—it reportedly will remain intact for years.

The hot-poured type is a thermoplastic, rubberized asphalt compound designed specifically for horizontal joints to prevent the infiltration of water, soil, or other solid materials into the joint spaces.

The cold-applied type is recommended primarily for the maintenance of older highways, as well as for new construction. This ready-mixed rubberized asphalt compound is especially suitable for narrow joints.

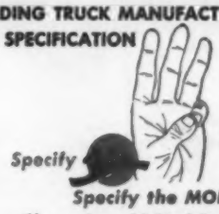
For further information write to A. C. Horn Cos., Division of Sun Chemical Corp., Dept. C&E, 2133 85th St., North Bergen, N. J., or use the Request Card that is bound in at page 18. Circle No. 107.

16 MODELS of 16

FULLER 3-SPEED AUXILIARIES

Specify FULLER...
Specify the MODEL
Get the 3-speed auxiliary designed for your job.

HIGH CAPACITY . . . WIDEST RANGE OF RATIOS . . . OPTIONAL TOP-MOUNTED POWER TAKE-OFF . . . LOW INITIAL COST, LESS MAINTENANCE . . . AVAILABLE FROM ALL LEADING TRUCK MANUFACTURERS ON SPECIFICATION

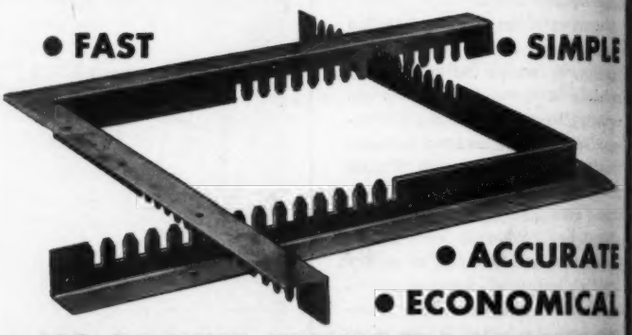


Specify the MODEL
Choose from 16 Models of FULLER Three-Speed Auxiliaries

FULLER MANUFACTURING COMPANY
(Transmission Division)
KALAMAZOO, MICHIGAN
Subsidiary EATON Manufacturing Company
For more facts, circle No. 355

clamps for concrete columns

Econ-O-clamp®
Trade Mark
REGISTERED U. S. PAT. OFF.



• NO BACKUP STRINGERS REQUIRED
write or phone for free catalog or demonstration

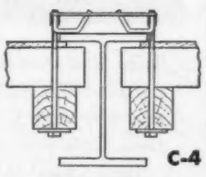
DESLAURIERS COLUMN MOULD CO., INC.
5036 W. LAKE ST. AUstin 7-1516 CHICAGO 44, ILL.

For more facts, use Request Card at page 18 and circle No. 356

D.S.G. COIL HANGERS

Engineered to your job—save time and labor

Dayton Sure-Grip & Shore Company serve the industry with a complete line of coil and saddle hangers. They meet all specifications . . . have a high safety factor . . . are designed to reduce forming time and costs. While of premium quality, they're competitively priced and readily available through a national network of jobbers. Our engineers will gladly help you plan your special forming requirements and layouts.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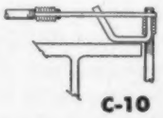
C-2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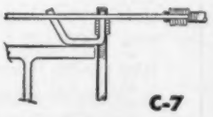
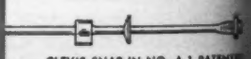

C-7

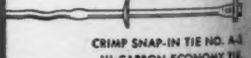
COMPLETE LINE OF ACCESSORIES FOR ANY FORMING REQUIREMENT.

Write for your free copy of our new catalog . . .

SURE-GRIP SNAP-IN FORM TIES
PREMIUM QUALITY—MADE OF HIGH CARBON STEEL—YET COMPETITIVELY PRICED


CLEVIS SNAP-IN NO. A-1 PATENTED CLEVIS ASSURES EASY BREAKBACK

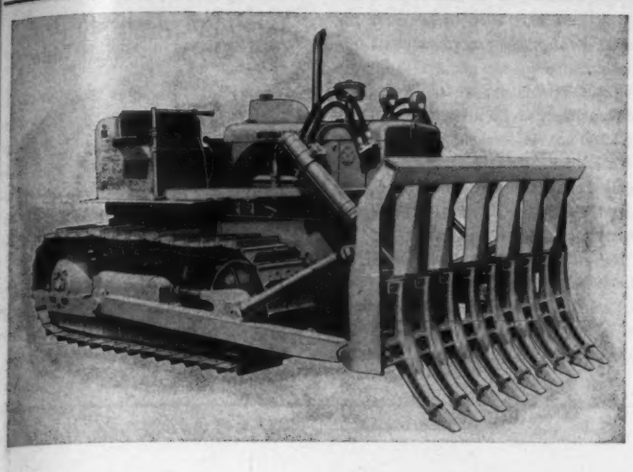
WOOD CONE SNAP-IN NO. A-2 WOOD CONE IN LIEU OF METAL SPREADER WASHER


CRIMP SNAP-IN TIE NO. A-3 HI-CARBON ECONOMY TIE. EXCELLENT QUALITY.

. . .

THE DAYTON SURE-GRIP & SHORE CO.
111 KERCHER ST., MIAMISBURG, OHIO

For more facts, Use Request Card at page 18 and circle No. 357



The new Drott land-clearing rakes range in width from 95 to 151 inches; in weight, from 1,405 to 4,580 pounds.

Land-clearing rakes available for tractors

Available for cable or hydraulic operations, bulldozing, or angledozing, the new Drott land-clearing rake attachment for use with International Harvester tractors from the TD-9 through the TD-25 moves trees, stumps, rocks, and boulders but leaves dirt in place. The attachment is offered with or without top brush guard.

The rake teeth are individually mounted and can be adjusted to suit the specification of the job. On the bulldozer line, tooth pitch can be adjusted for uprooting stumps or raking action.

Width of the rake ranges from 95 inches on the TD-9 to 151 inches on the TD-25. Weight of the entire rake ranges from 1,405 pounds for the smallest rake to 4,580 pounds on the largest rig.

For further information write to the Drott Mfg. Corp., Dept. C&E, 3126 S. 27th St., Milwaukee 15, Wis., or use the card at page 18. Circle No. 75.

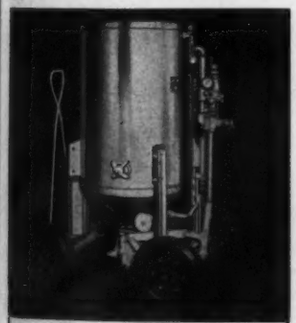
New cooling system for six engine models

A cooling system for non-radiator-cooled engines is available from the International Harvester Co.'s Construction Equipment Division.

Designated Flo-Matic, the system is recommended for all heat-exchanger-cooled International engines and reportedly maintains a high-volume, high-velocity coolant flow, producing more uniform engine temperatures.

The Flo-Matic system is available for three International V-8 engines—UV-401, UV-461, and UV-549, and for three 6-cylinder engines—UR-372, UR-450, and UR-501. Flo-Matic controls may also be adapted to many existing installations.

For further information write to the International Harvester Co., Construction Equipment Division, Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 21.



RUEMELIN SAND BLASTS

. . . provide fastest cleaning action. Remove rust, paint, scale from highway equipment, ready-mix drums, rail or highway bridges, water towers.
Available in several sizes, in stationary or portable mountings. Hi-speed trailer mounts permit easy handling. Units available with wet nozzles and remote controls at nozzle for instant stop and start control.

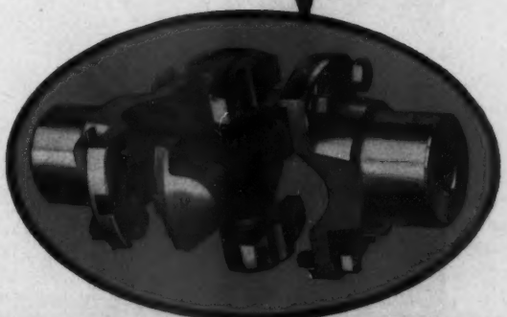
Write for descriptive bulletin.

RUEMELIN MFG. CO.
3867 No. Palmer St., Milwaukee 12, Wis.

For more facts, circle No. 358

REDUCE DOWN TIME for SERVICING from HOURS to FIFTEEN MINUTES

MECHANICS Roller Bearing UNIVERSAL JOINTS can be removed and replaced—on the road—in 15 minutes—with a wrench and hammer. Because keys and keyways are machined to fit, there is no danger of destroying the original accurate alignment and balance. This flange-type bearing assembly can be lifted out, simply by removing the cap screw bolts. Let our engineers show you how this and other exclusive MECHANICS Roller Bearing UNIVERSAL JOINT features will help give your product more competitive advantages.



MECHANICS UNIVERSAL JOINT DIVISION
Borg-Warner • 2030 Harrison Avenue, Rockford, Illinois
Export Sales: Borg-Warner International 36 So. Wabash, Chicago 3, Illinois

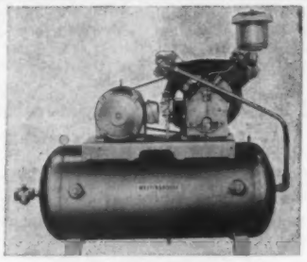
MECHANICS UNIVERSAL JOINTS
Roller Bearing BW
• For Cars • Trucks • Tractors • Farm Implements • Road Machinery •
• Aircraft • Tanks • Busses and Industrial Equipment •

For more facts, use Request Card at page 18 and circle No. 359

Improvements announced for unit-type compressor

New features on the Westinghouse Model 5YC unit-type compressor have been announced by the Le Roi Division.

Design changes on the 2-stage, 2-cylinder compressor include a new unloading system for automatic loadless starting. In addition to allowing the drive motor to reach full speed before the compressor begins to pump air, the system provides positive protection against low oil-level operation.



Also changed on the Model 5YC are the inlet valve unloaders for constant-speed operation. Unloaders have fewer parts than were used in previous assemblies and offer more efficient operation.

Rated operating pressures for the 5YC, using a 10-hp drive, are 125, 175, and 250 psi. The unit is also available with a 15-hp drive for 175-psi operation. The compressor has constant-speed, start-stop, or dual-control operation.

For further information write to the Le Roi Division, Westinghouse Air Brake Co., Dept. C&E, 1706 S. 68th St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 67.

Two-man portable drill will dig a 12-inch hole

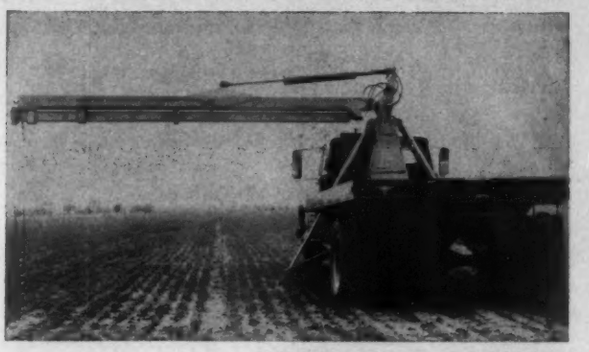
The General Equipment Co. offers a new heavy-duty portable 2-man power drill said to be exceptionally versatile and easy to handle.

Known as Model 32, the machine retains all the design features of the General one-man model: 2½-hp 2-cycle air-cooled engine with automatic rewind starter; straight-in-line drive with balanced torque output for easy handling; well balanced transmission with extra gear reduc-

tion to drive larger augers easily in difficult conditions; and a heavy-duty centrifugal clutch that disengages at idle speeds. This automatic clutch acts as a safety device, protecting the operator and the machine by disengaging when rocks are struck.

The unit weighs less than 50 pounds with an average-size auger. A full line of interchangeable and quickly detached augers, in sizes from 2 to 12 inches in diameter, is available for drilling in earth, ice, and wood.

For further information write to the General Equipment Co., Dept. C&E, Box 134, Owatonna, Minn., or use the Request Card at page 18. Circle No. 4.



Designed to work in a full 360-degree circle, the Model 200's boom lifts from 3,750 pounds (at 8-foot radius) to 2,500 pounds (at 16-foot radius).

New truck-mounted crane features 16-foot boom

A fully hydraulic truck-mounted crane with a 16-foot reach and a 3,750-pound capacity has been announced by Teale & Co.

The unit is designated Model 200. Its boom works in a full 360-degree circle and can be tilted up to a nearly vertical position. Dual controls (a full set on each side of the truck cab) facilitate rapid and accurate control of loads. The crane mounts in just 17 inches of space behind the cab.

The Model 200 is also available with a hydraulically telescoping boom that can be extended or retracted from 16 to 28 feet under full load and that offers lifting capacities up to 2,500 pounds.

For further information write to Teale & Co., Dept. C&E, P. O. Box 308, Omaha 2, Nebr., or use the Request Card at page 18. Circle No. 32.

Self-propelled mixer for small concrete jobs

The Port-A-Mixer, a self-propelled 3-cubic-foot-capacity mixer for smaller jobs, is offered by the Mars Equipment Co., Inc.

The unit's drum and wheels are driven by a 3¼-hp gasoline engine.

The company points out that this unit eliminates the use of a mortar box and a wheelbarrow: after the raw material is fed into the mixer, it proceeds to mix while being driven to the point of use.

A trailer is supplied to transport the Port-A-Mixer from job to job.

For further information write to Mars Equipment Co., Inc., Dept. C&E, 5209 W. Broadway, Minneapolis 22, Minn., or use the Request Card at page 18. Circle No. 27.

WORK AWAY...

WORRY-FREE

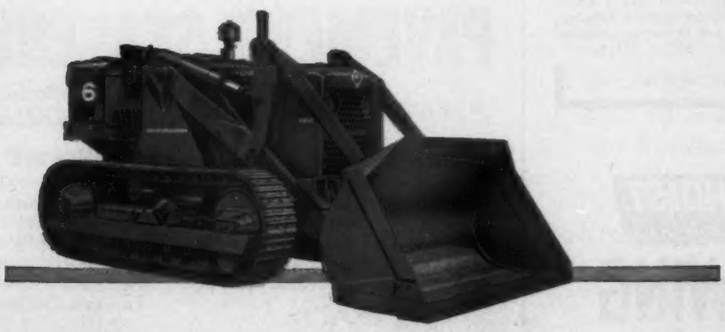
...NO ROLLER GREASING EVER!

The 72-hp Allis-Chalmers HD-6G is the only 1½-yd tractor shovel with permanently lubricated tapered roller bearing truck wheels, idlers, support rollers—gives you certified protection . . . saves greasing time, materials and money.

The PERMA-SAFE truck wheels, idlers and support rollers in the HD-6G are lubricated at the factory . . . need no further greasing regardless of conditions. PERMA-SAFE design with Positive Seals and tapered roller bearings keep lubricants in . . . dirt and moisture out . . . *for life.*

In addition to timesaving, care-free track lube, the HD-6G also features super pry-out action, highest dumping clearance, fastest reverse and many more big tractor shovel advantages.

Your Allis-Chalmers construction machinery dealer will be glad to put an HD-6G through its paces on your toughest job. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.



move ahead with

ALLIS-CHALMERS

... power for a growing world

For more facts, use Request Card at page 18 and circle No. 360

Offer new 2-way radio featuring compact design

A new table-model 2-way radio is announced by the General Electric Communication Products Department.

Units up to 60 watts are available in low band (25 to 54 mc and 72 to 76 mc), up to 50 watts in high band (144 to 174 mc) and 15 watts in UHF (450 to 470 mc). Depending on the frequency selected, power-amplifying equipment can be obtained on an optional basis, providing 250 to 330 watts output.

Also on an optional basis, units with selective-calling features are available, enabling the dispatcher to give a message to a single vehicle or group of vehicles.

For further information write to General Electric, Communication Products Dept., Dept. C&E, Room 273 CAP, Lynchburg, Va., or use the Request Card that is bound in at page 18. Circle No. 82.

The S & M Mfg. Co.'s 8-cubic-yard agitator with chutes extended, power gate open, and body raised to discharge low-slump concrete.

Offer improved model of concrete agitator

The new, improved Agitor, a concrete carrier-agitator available in 4, 6½, and 8-cubic-yard capacities, offers features that make it ideal for use in prestressed-concrete work, according to the S & M Mfg. Co.

The power gate has been enlarged to handle low-slump concrete with discharge speeds of more than 1 cubic yard in 10 seconds. Both flip-over paving chutes and standard folding chutes for ready-mix work are available.

A new air-pressurized flush water system is optional equipment. A choice of three power takeoffs is also available.

Open-top loading with fast dumping makes the Agitor a versatile dump body for use in hauling aggregate, salt, or other materials, as well as concrete, according to the manufacturer.

For further information write to the S & M Mfg. Co., Inc., Agitor Division, Dept. C&E, 2901 W. Mill Road, Milwaukee 9, Wis., or use the Request Card at page 18. Circle No. 128.

Offer glareproof dial for grader blade control

A new glareproof, easy-setting dial is available for the Preco automatic blade control for motor graders.

Reflection is eliminated by the use of a black anodized aluminum dial panel. The index of the recessed dial is flush with the calibrated scales, making for easier and more accurate dial setting from any position in the operator's compartment. On superelevated curves, the dial can be gradually moved to the changing slope settings as the grader travels along.

For further information write to Preco, Inc., Dept. C&E, 6300 E. Slauson Ave., Los Angeles 22, Calif., or use the Request Card at page 18. Circle No. 48.

SILENT HOIST KRANE KAR

360° SWING

2 SIZES:
MODEL FAX—12,000 lbs. cap.
MODEL FAY—20,000 lbs. cap.

THE LOW COST OF LIFTING WITH...

SILENT HOIST KRANE KAR

360° BOOM SWING—*Now . . . another addition to the famous family of Silent Hoist* **KRANE KAR** *. . . the original Mobile Swing Boom Crane!* **BOOM ROTATION:** *All-Hydraulic 360° continual rotation on heavy-duty double-race ball-bearing turntable.* **BOOM:** *15/22 ft., manual or hydraulic telescoping.* **TRANSMISSION:** *Hydraulic power shift directional in combination with flywheel torque converter.* **STEERING:** *Full time power steering, finger-tip control.* **ENGINE:** *Heavy duty 6 cylinder valve-in head type.* **BOOM TOPPING:** *Horizontal to highest vertical in only 8 seconds.* **BOOM HOISTING:** *Load block 3 parts of line 25 to 55 fpm.* **TIRES:** *Dual pneumatic tires on traction axle for high flotation and extra blow-out protection.* **TOTAL VISION AND SAFETY:** *No obstruction in any position of load or crane; operator fully protected through 360° rotation of boom. Write for complete details in illustrated bulletin 899.*

180° BOOM SWING—*The Standard widely favored All-Hydraulic or Mechanical 180° swing boom crane models. Lifts, carries, and places any load up to 12½ tons. One engine powers the machine for travel and all crane applications—finger-tip control. Front traction wheel drive supports chassis and crane load. 2 geared speeds for hoisting, topping, and swinging. No tail swing—Boom never passes over Operator's head. Write for complete details in illustrated bulletin 879.*

SILENT HOIST KRANE KAR

180° SWING

6 SIZES:
1½, 2½, 5, 10, 12½ tons

SILENT HOIST & CRANE CO. · BROOKLYN 20, N.Y.

For more facts, use Request Card at page 18 and circle No. 361

LOOK TO FLINTKOTE FOR JET FUEL RESISTANT PAVEMENT SEALERS...

Send today for complete specifications and technical data sheets on the following:

• **FLINTSEAL JFR*** (Hot poured) A one-component, rubber-tar thermoplastic compound to be melted and poured. Cools quickly, retains tough, elastic bond in pavement joints and cracks through cycles of expansion and contraction. Fed. Spec. SS-S-167b.

• **FLINTKOTE M-200** (Cold-Applied) Two-component, polymer type sealer. Sets quickly, resists aircraft fuel, heat and blast from jets. Bonds perfectly to concrete and remains ductile at minus 20°F. Interim Fed. Spec. SS-S-00200a and pertinent Purchase Descriptions, as modified.

• Also ask about exciting new Flintcrete†—Flintkote's polysulfide/epoxy concrete bonding compound for pavement restoration and repair.
• And Flintar*-coal tar pitch emulsion. Fed. Spec. R-P-00355a for sealcoating bituminous pavements. Write: The Flintkote Company, P. O. Box 157, Whippany, New Jersey.

FLINTKOTE

*Reg. U.S. Pat. Off. †T.M. of The Flintkote Company

Manufacturer of diversified products for home and industry

For more facts, use Request Card at page 18 and circle No. 362

SAM FINLEY, INC., of Atlanta, Georgia, uses the Huber-Warco maintainer to prepare base on many of smaller paving projects. They like the maintainer's versatility and ability to work in close quarters. The Huber-Warco 8-10 tandem roller compacted the hot-mixed asphalt used on this parking lot. The company uses 15 Huber-Warco machines in diversified paving work.

HUBER W WARCO

HUBER-WARCO *maintainers*

"Nine Machines In One"

VERSATILITY and year 'round performance are two important benefits of a Huber-Warco Maintainer. The basic machine has a nine-foot power sliding moldboard for routine grading work. Hydraulic controlled attachments quickly convert the Maintainer for service as Bulldozer, Lift-Loader, Scarifier, Berm Leveler, Side Dozer, Broom, Patch Roller and Snow Plow.

TORQUE CONVERTER combined with 45½ H.P. gasoline engine gives plenty of power for toughest jobs. Converter reduces shock loads, prolongs machine life, increases work capacity and cuts fuel consumption.

WORKING SPEEDS range from 1.7 to 8 M.P.H. Travel speed is 21 M.P.H. for quick movement between jobs. Weight is 6,250 lbs.—7,205 lbs. with calcium chloride in tires.

A complete line of optional equipment, in addition to the hydraulic attachments, is available for the Maintainer.

A trusted product name backed by respected distributor names from coast to coast

MOTOR GRADERS

Standard transmission models from 83 to 160 H.P. Torque converter and power shift transmission models from 102 to 195 H.P.

TANDEM ROLLERS

3-5 Ton • 4-6 Ton Retractable • 5-8 Ton • 8-10 Ton • 8-12 Ton • 10-14 Ton

3-WHEEL ROLLERS

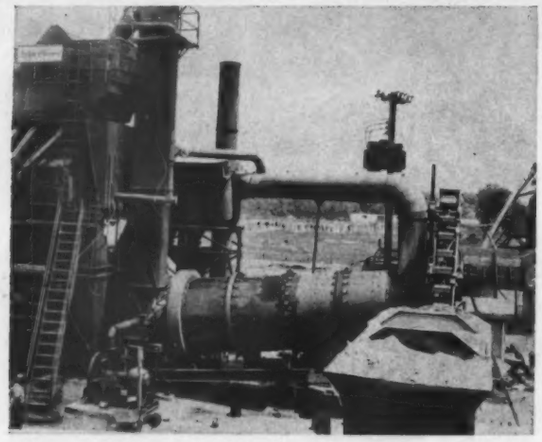
10-Ton • 12-Ton • 14-Ton Standard Weight 10-12 Ton • 12-14 Ton Variable Weight

MAINTAINER

M-52 — 45½ H.P. Attachments are Lift-Loader, Broom, Bulldozer, Patch Roller, Scarifier, Snow Plow, Berm Leveler

HUBER-WARCO COMPANY Marion, Ohio, U.S.A.

For more facts, use Request Card at page 18 and circle No. 369



With the addition of two new dryers and dust collectors, Barber-Greene asphalt-mixing-plant equipment covers capacities ranging from 30 to well over 200 tph.

Add two new dryers to asphalt-plant line

The Barber-Greene Co. announces two new rotary aggregate dryers, the Models DA-55 and DA-65, together with portable and stationary cyclone-type dust collectors appropriate to both dryer sizes.

The Model DA-55 dryer, with its companion CA-55 portable dust collector or CB-55 stationary collector, serves plants in the 90 to 125-tph range. Each collector is capable of furnishing exhaust-gas capacity in the 18,000-cfm range.

The Model DA-65 dryer, with either a CA-65 portable or CB-65 stationary collector, serves plants in the 150 to 220-tph range. Either collector has an exhaust capacity in the 23,000-cfm range.

For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 2.

Metal edges and struts double life of forms

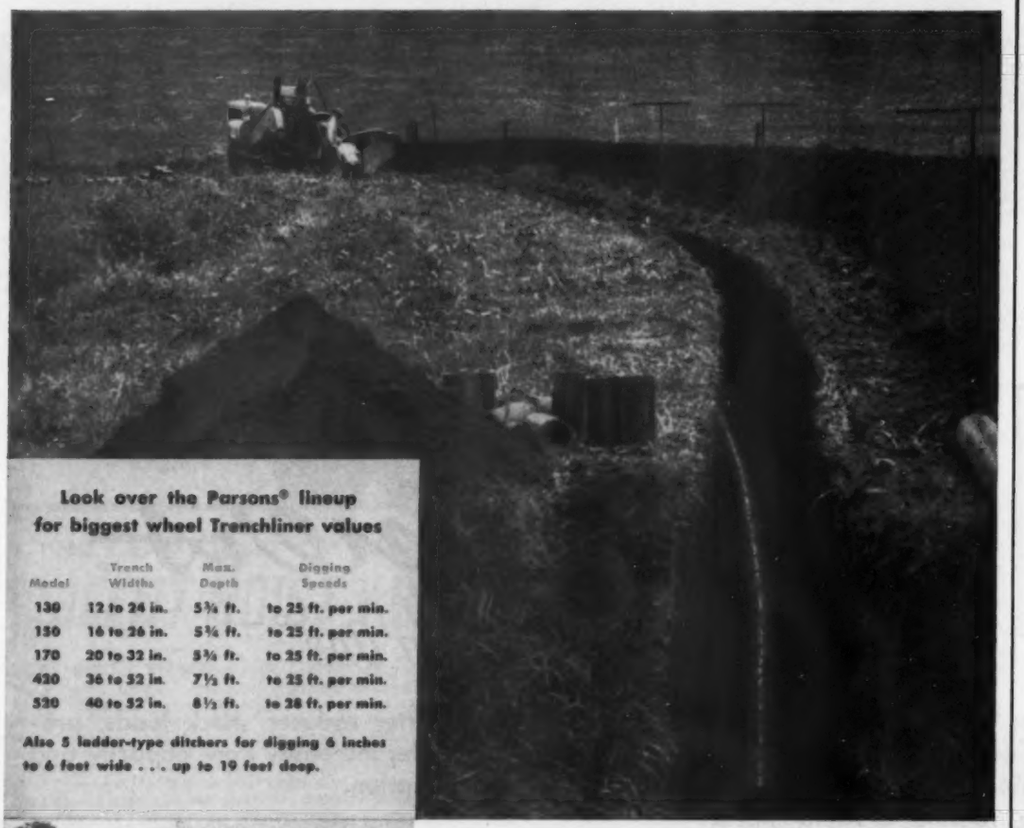
A lightweight panel system featuring galvanized metal edges and struts said to double the life of panel forms has been announced by the Engineered Concrete Form Corp.

Panels come in modules of 2 × 4, 2 × 6, and 2 × 8 feet, and can be used vertically or horizontally and in combination for any wall type or height.

For further information write to the Engineered Concrete Form Corp, Dept. C&E, 7658 S. Wentworth Ave, Chicago 20, Ill., or use the Request Card at page 18. Circle No. 106.

High-accuracy transit for all-weather use

The Brunson Model 50 engineer's transit, a precision instrument featuring securely sealed, permanently lubricated ball-bearing construction for lasting accuracy under all climatic conditions, is available from the



Look over the Parsons® lineup for biggest wheel Trenchliner values

Model	Trench Widths	Max. Depth	Digging Speeds
130	12 to 24 in.	5¾ ft.	to 25 ft. per min.
150	16 to 26 in.	5¾ ft.	to 25 ft. per min.
170	20 to 32 in.	5¾ ft.	to 25 ft. per min.
420	36 to 52 in.	7½ ft.	to 25 ft. per min.
520	40 to 52 in.	8½ ft.	to 28 ft. per min.

Also 5 ladder-type ditchers for digging 6 inches to 6 feet wide . . . up to 19 feet deep.

MORE DITCH PER DAY IS WHAT WE'RE SELLING

Cost per lineal foot of ditch may vary depending on ground, but for more ditch per day, every day, at lowest possible cost, you're always miles ahead with a Parsons big wheel Trenchliner®. Here are some good reasons why:

Perfect weight balance for maximum tractive and digging effort . . . Hydraulically controlled digging wheels to help maintain closest grade tolerances with minimum effort . . . Wide range of digging speeds for best production in any ground.

There's a Trenchliner for every ditching requirement. See your Parsons distributor soon.

See your distributor about the 1960 KOEHRING EQUIPMENT SHOW—Waukesha, Wis., week of Sept. 19th.

PARSONS COMPANY
Newton, Iowa

A Division of **KOEHRING** *Company*

P10

For more facts, use Request Card at page 18 and circle No. 364

If it's faster hand uncoupling you want with more feet drilled per shift, use the rope-thread Brunner & Lay assembly. Request literature showing types and sizes available.

Brunner & Lay, Inc., 9300 King St., Franklin Park, Ill. *Est. 1882*, Plants & conversion shops: Albuquerque, Asheville, Birmingham, Dallas, Long Island City, Los Angeles, Philadelphia, Sacramento, Seattle, Yardley (Spokane), Lachine, P.Q.

Brunner & Lay

carbide ROK-BITS • DRILL RODS • INTRASET STEEL COUPLINGS, ADAPTERS, SECTIONAL STEEL, STRIKING BARS Standard or HOPE threads. MOIL POINTS, CLAY SPUDS, ASPHALT CUTTERS, etc.

For more facts, circle No. 365

The axes of the Brunson engineer's transit are completely protected from dust and moisture.

Charles Bruning Co., Inc.

According to the manufacturer, the transit operates freely and accurately at temperatures ranging from minus 10 degrees to plus 160 degrees F. Bearing wear is said to be practically eliminated; maintenance is reduced to a minimum.

The 5-inch-diameter vertical circle, graduated to 30 minutes, has a double vernier which reads to 1 minute. The 5¼-inch-diameter horizontal-circle verniers also read to 1 minute.

High accuracy is said to be obtained on both minimum-focus and long-range shots because of the Model 50's exceptionally accurate lens alignment in the 22X-power, internal-focus, erecting-image telescope. The 10½-inch telescope has a minimum focus of 3½ feet from axis to target.

For further information write to the Charles Bruning Co., Inc., Dept. C&E, 1800 Central Road, Mount Prospect, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 68.

A weight-saving corrugated body is offered by the KW-Dart Truck Co. on its Model 35SL off-highway hauler. The use of a corrugated body, states the manufacturer, reduces the truck's weight by more than 4,000 pounds—increasing its capacity from 35 to over 37 tons. Equipped with a 450-hp diesel engine, the Model 35SL features a 3-speed transmission and 3-stage torque converter with downhill braking feature. For further information write to the **KW-Dart Truck Co.**, Dept. C&E, P. O. Box 321, Kansas City 41, Mo., or use the Request Card at page 18. Circle No. 51.

ROTARY SWEEPER BROOMS

WE MANUFACTURE ALL SIZES
NAME YOURS

- Austin-Western
- Cub Cowboy
- Dot-Harvester
- Fordson
- Fuqueco
- Gravo
- Gutierrezipo
- Hough
- Huber
- Jaeger
- Littlefords
- Little Giants
- Moll (M.B.) Blumberg
- Ram
- Rosco
- Spearswell
- Tampo
- and many others

$69.50 up

Brooms filled with fibers of Palm-Hickory-Bass-Spring Steel Wires or DuPonts Nylon.

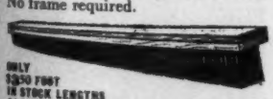
SAVE MONEY — if you fill your own order core only without filler.

REFILLING any make size or BUILDING type. New slats-PAIRING hubs-shaft-cable.

WE SHIP WORLDWIDE-IMMEDIATELY
Road Builders — it's sensational!
ROAD DRAG LEVELERS BROOMS

BIG PECKERWOOD BIG

For even distribution of materials six inches wide — lengths to 12 feet. No frame required.



ONLY $3.50 FOOT
IN STOCK LENGTHS
4', 6', 8', 10' or 12'

COCOA ROLLER MATS — STREET PUSH BROOMS

KENNEDY'S
VAN BRUSH MFG. CO.
3734 McGee Trfwy. Kansas City, Mo.

For more facts, circle No. 366

COMPARE BUFFALO-SPRINGFIELD 3-WHEEL ROLLER WITH ANY OTHER

TAKE a good look into the Buffalo-Springfield 3-wheel roller . . . compare it with other makes on the market. You'll find solid reasons why the Buffalo-Springfield 3-wheel has long been a favorite among contractors. Here are just a few advantages: each drive roll has heavy-duty, double-shoe type, self-energizing power brakes. *All* rolls run on tapered roller bearings. Field-proved 4-speed transmission delivers a full range of road speeds at full power. All internal parts operate in oil bath. Bevel gear differential provides smoother operation around curves.

When the 3-wheel does need adjustments — and this doesn't happen too often — they can be made in minutes. Large inspection covers give quick access to all working parts. You don't have to dismantle one part of the machine to get at service points . . . save time. Clutches are well forward of drive rolls and protected against dirt and grit by metal shrouds. Both are readily accessible at all times.

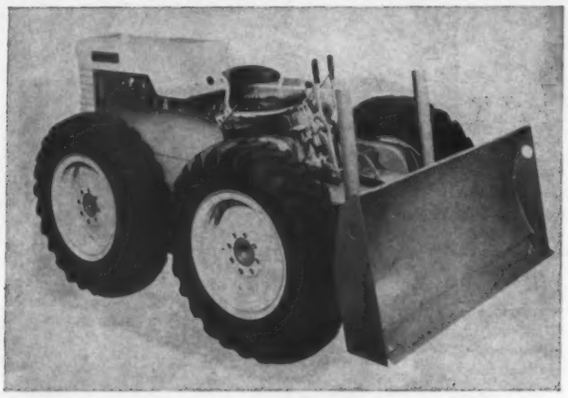
For the full story on the quality Buffalo-Springfield 3-wheel roller, and facts on how it can save you money over the long haul, see your Buffalo-Springfield distributor. Variable weight 10-14-ton and 12-15-ton models available.

Ask your distributor about the 1960 KOEHRING EQUIPMENT SHOW Waukesha, Wis., Week of Sept. 19th

BUFFALO-SPRINGFIELD CO.
Springfield, Ohio

A Division of KOEHRING Company

For more facts, use Request Card at page 18 and circle No. 367



Maximum traction, visibility, and maneuverability are major features of the Detroit Model 44-35 utility dozer.

All-wheel-drive bulldozer designed for utility work

Detroit Tractor, Ltd., announces the Model 44-35 all-wheel-drive bulldozer.

The unit features a 49-hp engine, with a choice of diesel or gasoline. Planetary steering, controlled traction, and maximum maneuverability are other features. An all-welded frame gives a low center of gravity with a full 20 inches of clearance. Positive up-and-down hydraulic coupled with a rugged bulldozer blade and inside push arms facilitate precision work, states the manufacturer.

For further information write to Detroit Tractor, Ltd., Dept. C&E, 1271 E. Keating Ave., Muskegon, Mich., or use the Request Card that is bound in at page 18 of this issue. Circle No. 131.

SAVE TIME—MONEY ON THE JOB WITH POWERFUL TWO-WAY RADIO

Citizens Band Radios by Pearce-Simpson, Inc. Anyone can operate. No license examination. Talk from office to trucks, car to car, perfect for field operations. Currently used by many contractors and engineers for instant communications. Range one to 30 miles. Set is compact, easily movable. Single and multi channel sets available. 5 watts input.

CBD-1: Single channel complete with microphone, crystal, universal mounting bracket, both power supply cables **$159.50**

CBD-5: Five channel set (shown above). Available dual volt DC, 115 AC, or 6 volt only. Crystals for one channel, microphone, both power supply cables, etc. **$170.00**

Write for free brochure:

PEARCE-SIMPSON, INC.

For more facts, use Request Card at page 18 and circle No. 368

Concrete admixture speeds prestress job

In the prestressed deck slabs and beams of New York's Pier 40, a concrete admixture called Sonotard is said to have played an important role by controlling the initial rate of hardening and fluidity of concrete for optimum placement properties.

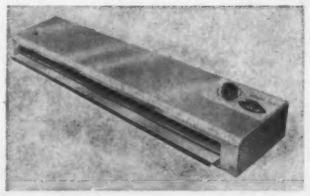
Sonotard speeded the strength development (15 hours of steam cure averaged over 4,500 psi), permitting early release of tension and early stripping of forms. Since Sonotard does not increase the air content while reducing water requirements, it allows the operator to accurately control the total air at all times.

For further information write to the Sonneborn Chemical & Refining Corp., Building Products Division, Dept. C&E, 404 Park Ave. South, New York 16, N. Y., or use the Request Card that is bound in at page 18. Circle No. 126.

New rotary diazo printer produces prints at 6 fpm

Grico, Inc., announces a new, fast-speed rotary diazo printer, the Super-Satellite.

Measuring 48 × 10 × 5 inches and weighing 65 pounds, the compact Super-Satellite may be plugged into any 115-volt convenience outlet for immediate operation without warmup,

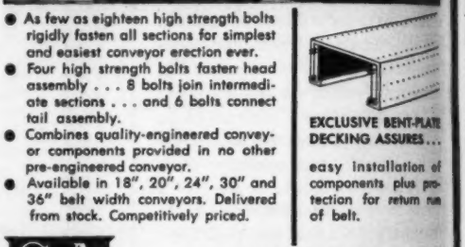


utilizing a single high-output fluorescent lamp enclosed in a transparent rotating cylinder. Simple to operate, it has but one control for off-on, reverse, and all speeds.

At 6 fpm, subject to variation as selected by the operator, this machine produces white prints up to 42 inches wide and of any length.

For further information write to Grico, Inc., Dept. C&E, 1279 Munroe Falls Ave., Cuyahoga Falls, Ohio, or use the Request Card at page 18. Circle No. 53.

S-A SECTIONAL BELT CONVEYOR with BENT PLATE DECKING *Simplifies Erection*



- As few as eighteen high strength bolts rigidly fasten all sections for simplest and easiest conveyor erection ever.
- Four high strength bolts fasten head assembly . . . 8 bolts join intermediate sections . . . and 6 bolts connect tail assembly.
- Combines quality-engineered conveyor components provided in no other pre-engineered conveyor.
- Available in 18", 20", 24", 30" and 36" belt width conveyors. Delivered from stock. Competitively priced.

EXCLUSIVE BENT-PLATE DECKING ASSURES . . . easy installation of components plus protection for return run of belt.

S-A

WRITE FOR BULLETIN 458

STANDARD PRODUCTS DIVISION
STEPHENS-ADAMSON MFG. CO.
97 RIDGEWAY AVENUE • AURORA, ILLINOIS
PLANTS LOCATED IN: LOS ANGELES, CALIFORNIA
CLARKSDALE, MISSISSIPPI • BELLEVILLE, ONTARIO

For more facts, use Request Card at page 18 and circle No. 370

THREE JOHNSON ALL-WELDED BUCKETS TO MEET YOUR CLAMSHELL NEEDS

WIDE REHANDLING
Live loads are stepped up to maximum because all dead weight is eliminated. Ideal for handling loose materials.

GENERAL PURPOSE
Shown at left, this bucket has low center of gravity to concentrate full digging power on lips, teeth. Manganese cutting edges get tougher with use.

HEAVY-DUTY DIGGING
Weight saved by welded construction in other parts is put back in sides, lips and bottom for deeper penetration and extra digging power.

C. S. JOHNSON CO.
Champaign, Ill. • Stockton, Calif.
A Division of KOEHRING *Company*

Please send more data on ____ cu. yd. . . .
☐ Rehandling Clamshells
☐ General Purpose Clamshells
☐ Heavy-Duty Clamshells

Name _____
Company _____
Street _____
City _____ Zone ____ State _____
III C&E

For more facts, use coupon or circle No. 369

This Compact FUNK Unit *SAVED* Space

On this Jaeger concrete mixer, a FUNK double right angle drive provides a perfect alignment and positive chain adjustment. Mounted vertically on the "unitized" front trunnion stand, FUNK's unit takes only a fraction of the space normally used in such applications.

It always pays to look for FUNK Modular Power Units on the equipment you buy.

FUNK MFG. CO. P.O. Box 577-B COFFEYVILLE, KAN.

For more facts, use Request Card at page 18 and circle No. 371

New line of medium, heavy-duty trucks

A new line of medium and heavy-duty truck models is announced by the Reo Division of The White Motor Co.

The new series includes a 90-inch bumper-to-back-of-cab truck and tractor line featuring Reo Gold Comet V-8 engines; a 62-inch bumper-to-back-of-cab hydraulic tilt cab-over-engine line; a Fiberglas tilt cab-forward line; a 90-inch bumper-to-back-of-cab diesel tractor line; and a 86-inch bumper-to-back-of-cab aluminum tilt-cab diesel line. The bumper-to-back-of-cab dimensions are designed to allow Reo tractors to pull maximum-length trailers within legal limits.

For further information write to The White Motor Co., Reo Division, Dept. C&E, Washington Ave., Lansing 20, Mich., or use the Request Card at page 18. Circle No. 95.

Self-propelled trencher offers several features

A new self-propelled trencher, the Trench-Devil L-12, has been announced by the Arps Corp.

This versatile machine weighs approximately 1,460 pounds and is capable of digging depths of 2½, 3½, 4½, and 5½ feet, with tough chisel or slicer cutters available for digging widths of 4, 6, 8, 10, and 12 inches. Power is supplied by a Wisconsin air-cooled 12½-hp heavy-duty AGN engine. Digging speed is variable from 0 to 1,200 feet per hour in forward or reverse.

A major feature is the heavy-duty, rubber-belted conveyor that deposits dirt on either side of the trench without power loss or side thrust, assuring positive, straight-line trenching. The conveyor can be detached from one side and installed on the other within 60 seconds, states the manufacturer. An adjustable deflector controls the distance that dirt is deposited from the edge of the trench.

For further information write to the Arps Corp., Dept. C&E, New Holstein, Wis., or use the Request Card at page 18. Circle No. 58.

The Trench-Devil L-12 digs to a depth of 5½ feet and to a maximum width of 12 inches.

Set for 10-foot passes, a rubber-tire bituminous paver-finisher was used by Allegheny Contracting Industries, Inc., of Pittsburgh, to resurface 3½ miles of the Ohio River Boulevard between nearby Emsworth and the McKees Rocks Bridge. The 40-foot-wide brick and concrete roadway was topped with 2 inches of binder and a 1-inch-thick finish course. The Blaw-Knox machine reportedly placed 1,200 tons of asphaltic concrete during an 8-hour working day. Allegheny contracted the project from the state highway department. For further information write to the **Blaw-Knox Co.,** Construction Equipment Dept., Dept. C&E, Mattoon, Ill., or use the Request Card at page 18. Circle No. 36.

ask the man who "drives by the seat of his pants"

You ask the man who operates a Lorain Moto-Loader 157 and he'll tell you . . . here is an "all-around" machine that gives peak performance. For a loader to do a job faster and more efficiently with minimum operator fatigue it has to be perfectly balanced in *all* respects. And this Moto-Loader® is. It has *everything!*

for control balance

. . . one-foot control of forward-reverse and acceleration frees both hands for steering and other controls . . . lets the operator concentrate on smooth flowing cycles. More production, less fatigue.

for power balance

. . . engine size, hydraulic capacity, torque converter ratio, all combine to provide the right degree of power needed for superior tractive effort and all the phases of the digging and loading cycle.

for weight balance

. . . a low center of gravity, a ground-hugging weight-to-axle distribution . . . even the tread and wheel base of the machine are designed for maximum stability. No teeter, bounce or wobble. You can carry loads high and fast for time-saving cycles.

See Moto-Loaders in action. There's the ML-157 with 7000-lb. carrying capacity and the ML-153 with 6000-lb. carrying capacity. Either will build your profits. See your Moto-Loader distributor.

Clearing nine acres for a school . . . loading out brush and logs . . . excavating basements—this is how the ML-157 pays off for Ralph Boerema Excavating Co. of Sand Lake, Mich. Operator says that "Moto-Loader handles trucks nicely . . . loads up fast."

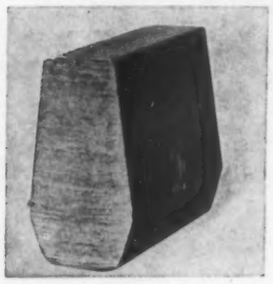
Backfilling 30,000 feet of trench for water pipe, the Moto-Loader handles dirt and stone . . . works on piles varying from 6 to 10 feet high. Clark Sewer Construction Co. of Bridgeport, Conn., is completely satisfied with the ML-157's fast performance.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN® ON THE MOVE

For more facts, use Request Card at page 18 and circle No. 372

Grouser-bar design permits fast welding



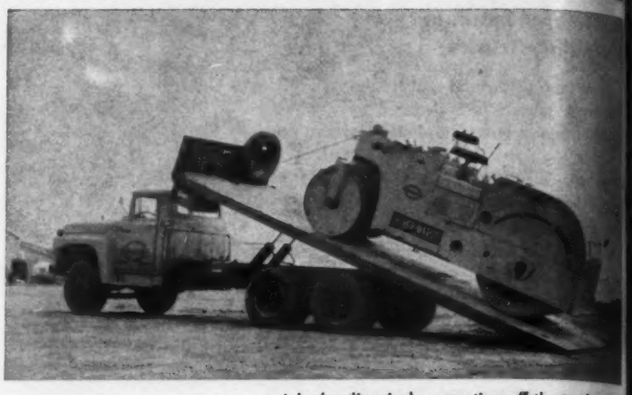
Sur-Trac grouser bars, offered by the American Steel Products Corp., are designed for fast welding.

The worn grouser is cut or ground even, and the Sur-Trac bar is welded in its place. Sur-Trac grouser bars can be applied without dismantling the truck.

These grouser bars are designed for complete weld penetration with a minimum of weld metal and can be welded by hand or automatically.

The bars come in 10-foot lengths or can be furnished precut ready for welding.

For further information write to the American Steel Products Corp., Dept. C&E, 8700 Kinsman Road, Cleveland 4, Ohio, or use the Request Card at page 18. Circle No. 77.



A hydraulic winch, operating off the truck power takeoff, draws equipment onto the platform.

Hydraulic ramp hoist for heavy equipment

A hydraulic ramp hoist designed for transporting equipment weighing up to 15 tons is announced by the Schwartz Mfg. Co.

Equipment is drawn onto the platform by means of a hydraulic winch operating off the truck power takeoff. When the equipment is in position, the platform is hydraulically lowered and the equipment is then transported by truck.

For further information write to the Schwartz Mfg. Co., Dept. C&E, Lester Prairie, Minn., or use the Request Card at page 18. Circle No. 62.

New tandem roller needs no greasing

The Essick Mfg. Co. announces a new 1½ to 2-ton tandem roller.

Known as Model 220, this roller is said to offer greater over-all visibility and longer life with an automotive-type brake located on the compression roll. Larger, wider rolls

YARDAGE BOOSTER! ATECO ripper on this Euclid TC-12 fractures shale for fast, easy scraper loading. Same machine and operator push-loads scrapers and handles bulldozing on the job.

3 Reasons why it pays to use

ATECO RIPPERS...

BIGGER PAYLOADS with less boosting, less scraper wear and tear are the profitable results of ripping between scraper passes on this cut and fill job. International TD25 with dozer and ATECO ripper is ready to rip, doze or push-load as needed.

LOW COST PAVEMENT BUSTING! ATECO rippers on two Caterpillar 977 loaders make quick work of this repave job. ATECO rippers will break up any kind of unreinforced pavement into easy bucket loading material.

1. *Step up production 20% or more!* You'll be hours and dollars ahead to *rip almost any material first*—whether you're loading by scraper, loader or dragline. Just a few passes with an ATECO ripper fractures and loosens anything but solid granite or bar-reinforced concrete into easy-loading condition. You don't need another machine or operator—just put an ATECO ripper on the rear of your dozer tractor or loader. One machine, one operator, is ready to rip, load or bulldoze to give you 20% to 30% higher production at far lower costs per yard!

2. *Save wear and tear on loading equipment* . . . Loading ripped material is far easier on your scraper, loader or dozer. You'll get months, even years, of extra service life and save costly downtime and repairs.

3. *Eliminate costly shooting and pavement breaking* . . . Rugged ATECO rippers will penetrate, rip and fracture rock, shale, cemented gravel, caliche, hardpan, sandstone, asphalt, non-reinforced concrete—and do it at a fraction of the cost of shooting, drop-ball or pavement breaker operation.

ATECO pioneered the tractor-mounted rock ripper, and builds the most complete ripper line on the market today—for all makes of crawler tractors and crawler-type front-end loaders. ATECO rippers have a world-wide record of superior performance, proved on thousands of jobs. Why settle for less? Write or wire for the facts about ATECO rippers now—please address Dept. 20.

American

ATECO TRACTOR EQUIPMENT

Corporation *Designers and Manufacturers Since 1920*

9131 San Leandro Blvd., Oakland 3, Calif. • 6541 West 65th Street, Chicago 38, Illinois

For more facts, use Request Card at page 18 and circle No. 373

FOUNDATION CONSTRUCTION

CAISSONS

DRILLED AND UNDERREAMED

PIERS

SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C., Cleveland, Ohio

Wire or phone for a quotation on your next foundation job—

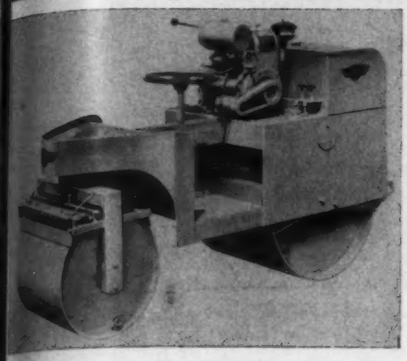
ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY

NACOGDOCHES, TEXAS

Ph.: LOgan 4-8373 • P. O. Box 190

For more facts, circle No. 374



Additional safety factors plus less maintenance are major features of the new Essick 1½ to 2-ton roller.

and a lower center of gravity give the unit considerably more stability. All controls are within easy reach of the operator.

According to the manufacturer, less maintenance is assured with the Essick-designed constant-mesh transmission, with readily accessible clutches, heavy-duty roller chain and sprockets on the final drive, plus lifetime lubricated bearings.

Automotive-type steering is another important feature, as well as larger-diameter guide rolls that stay on top of the asphalt, resulting in better densities and smoother surface finishes.

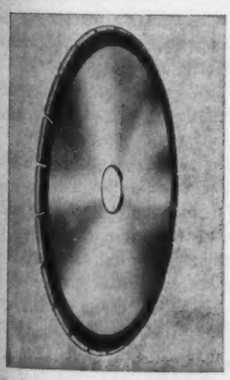
Standard equipment includes a trailer designed for loading and unloading by one man.

For further information write to the Essick Mfg. Co., Dept. C&E, 1950 Santa Fe Ave., Los Angeles 21, Calif., or use the Request Card that is bound in at page 18. Circle No. 37.

Circular saw blades for wet cutting

A new line of diamond-segmented circular saw blades for wet cutting of concrete and many other hard substances is announced by Hoffman Bros. Drilling Co., Inc.

According to the manufacturer, the gullet-type segmentations (available



in various widths and heights) prevent blade warping, thus practically eliminating binding and dragging.

The blades are available in a range of diameters from 8 to 36 inches and in special sizes.

For further information write to the Hoffman Bros. Drilling Co., Inc., Dept. C&E, Box 426, Punxsutawney, Pa., or use the Request Card at page 18. Circle No. 113.

For more facts, use Request Card at page 18 and circle No. 376 ▶

WINSLOW—PORTABLE TRUCK SCALE

THE CONTRACTORS' SPECIAL SCALE

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacity: 15-18-20-30, 40 and 50 tons.

Write us for name of your nearest distributer.

WINSLOW SCALE COMPANY P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 375

MOVING A MOUNTAIN IN 8 HOURS

Two 3½-Yd. P&H Shovels Move 8,832 Tons of Rock In One Work-Day... for

HEINTZ-ROGERS CONSTRUCTION CO., Portland, Ore. on a Railroad Relocation Project, Snake River, Wash.

ABOVE: 3½-yard P&H crawler shovel loads 276 trucks (16-ton) in an 8 hour shift. **BELOW:** Fast swings, accurate controls makes it easy to sort out big rocks for rip-rap.

R. A. Heintz, president of R. A. Heintz Construction Co. and sponsor for above job reports: "We've used our two 3½-yard P&H Crawler Shovels extensively on this job—they've saved us about 25% in rock handling and drilling . . . and account for such daily tonnage records as 8,832 tons of blasted rock in 8 hours. Our larger capacity P&H shovels not only give us greater production but, because they handle larger sized rock, reduce our drilling costs—bringing down the over-all cost and earning us a bigger monthly estimate. We're seriously considering buying more and bigger P&H equipment—we're more than pleased with its performance."

This project involves the removal and redistribution of 5 million cubic yards of material along a 12 mile stretch of the Snake River. Construction of the Ice Harbor Dam will raise the water level of the river 40 feet, requiring relocation of the present railroad tracks to higher ground.

RUGGED, DEPENDABLE IN HEAVY ROCK—"*Working in heavy rock is hard on equipment and hard on a production schedule. With P&H rigs, I've noticed we get faster swing cycles and faster loading with no overheating of the swing clutches.*" So reports Russ Stroud, who has been operating construction equipment for over 24 years. He says—"*Magnetorque swing drive is faster, smoother with no jerking. Doesn't need maintenance and doesn't wear me out.*"

SMOOTH PERFORMANCE, TOP PRODUCTION—The exceptional performance of the two P&H machines has enabled Heintz-Rogers Construction Company to maintain top tonnage performance. Fast, smooth swings, accurate control of the work load and more time on the job has helped speed up work cycles and production. More proof why ONE P&H ALWAYS SELLS ANOTHER.

For the detailed story on this job, write for Case History Report No. 111.

HARNISCHFEGER P&H
Milwaukee 46, Wisconsin

TOPS IN TARPS

Contact Fulton now!

Fulton efficiency means immediate delivery of all standard sizes and weights, and fast, quality production to meet *all your custom requirements.* Over 90 years experience assures you of quality-controlled production—from raw cotton to finished tarps and curing mats.

All Fultex and Shuredry tarps have all-around 1½ inch hem . . . grommets anchored in four layers of duck . . . triple-stitched seams! Fulton processing insures all-weather resistance . . . prolonged wear . . . complete protection. Your company name stenciled free! Phone or write Fulton now. Buy direct from the mill for substantial savings.

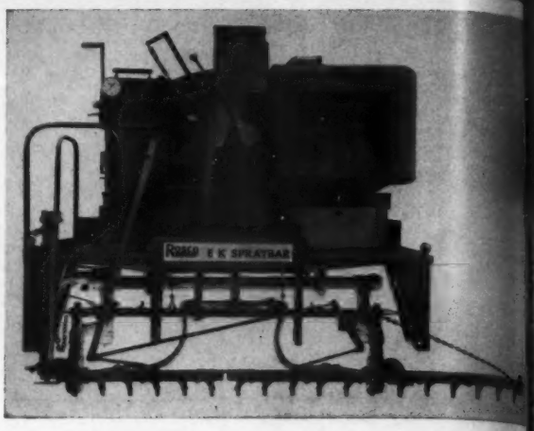
. Also Nylon Tarps, Cotton and Burlap concrete curing mats

Fulton
COTTON MILLS

P. O. Box 1726, Atlanta 1, Ga. / MUrray 8-1111 / TWX: AT 24

For more facts, use Request Card at page 18 and circle No. 377

***Product Parade*—THESE PRODUCTS CAN HELP WIDEN YOUR PROFIT**



The Model EK spraybar features individual valves for each nozzle. They may be disengaged separately to change widths of applications.

New spraybar offered for bituminous distributors

A new type of spraybar for its bituminous distributors has been announced by Rosco Mfg. Co. Designated Model EK, it features instant start and stop, no-drip shutoff, instant reverse suction, and improved safety breakaway.

For changing application widths, individual valves can be readily disengaged by turning them away from the gang control. A damaged valve requiring replacement is easily removed by unscrewing it from the bar.

Nozzles and valves are on 4-inch centers, giving triple lap spray to assure uniform coverage.

For further information write to the Rosco Mfg. Co., Dept. C&E, 3128 Snelling Ave., Minneapolis 6, Minn., or use the Request Card at page 18. Circle No. 96.

Explosives plant mounts on truck or trailer

An explosives mixing plant on wheels, the Baughman Model PE-4 ammonium-nitrate-transporter body carries that dynamite-type explosive as inactive material.

A built-in body mixer premeasures and adds explosive oil to the nitrate as the body is unloaded.

Units can be supplied with either PTO or auxiliary engine drives and may be mounted on truck or trailer.

For further information write to the Baughman Mfg. Co., Dept. C&E, 138 Arch St., Jerseyville, Ill., or use the card at page 18. Circle No. 86.

Grader disk attachment for variety of jobs

The Towner Mfg. Co. offers a disk attachment designed for shaving and cutting up oiled roads requiring resurfacing; aerating borrow pits or fill; mixing and preparing caliche roadbeds; and a wide variety of other jobs.

Designated Model MGD, the unit is quickly and easily attached to any Caterpillar No. 12 or No. 14 motor grader equipped with hydraulic power and operating valve.

GREENVILLE RIPPER FOR IH TD-15, 20, 25

TURN TRACTOR INTO 4-WAY MACHINE

. . . rip . . . bulldoze . . . tow . . . pushload without changing tools

RIP AT ANY DEPTH . . . Pitch and depth control adjustments permit ripping at any depth. From basic settings, operator can adjust hydraulically as required. Settings can be made in seconds. Hydraulic system holds points at desired depth. Shank design and pitch control keep points at best ripping angle.

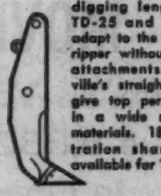
LIVE SWIVEL ACTION . . . Shanks smoothly swivel 15° in either direction on heavy pins — seek out weak spots in rock. It gives points a live action that shatters rock with a jackhammer action. Shanks follow tractor like a trailer.

FINGER-TIP HYDRAULIC CONTROL . . . Finger-tip control of the "power-matched" hydraulic system exerts Goliath-like power which distributes the weight of the tractor on ripping points for fast, complete penetration.

THE GREENVILLE TRAILING SWING BRACKETS work separately, each pivoting about a heavy pin to seek out weak spots in rock. The ripper weight balances dozer, resulting in greater traction and more usable horsepower.

BOOSTER RIPPING . . . A push block, straddling the center shank and swing beam can be attached very quickly by pinned connections. This permits use of the combined efforts of two tractors for added ripping power.

CURVED SHANKS are available in 24" maximum digging depth for TD-20 and 25. These shanks give their best performance in materials that are not blocky or slabby in formation.



STRAIGHT SHANKS are available in 24", 42" and 48" maximum digging lengths for TD-25 and all will adapt to the standard ripper without special attachments. Greenville's straight shanks give top performance in a wide range of materials. 18" penetration shanks are available for TD-15.

REPLACEABLE POINTS . . . For use with curved and straight shanks.

Tractor	Max. Ripping Depth W/Std. Shanks	Ground Clearance 24" Shank	Ground Clearance 18" Shank	Overall Width Tool Beam	Tool Beam Cross Sect.	Pump Data (Rear PTO)	Cyl. Dimensions Bore	Cyl. Dimensions Stroke	Pist. Rod Diam.
TD-25	24"	31"	—	108"	11" x 12⅝"	60 gpm @ 1000 psi	8"	15½"	3"
TD-20	24"	24"	—	102"	10" x 12"	44 gpm @ 1000 psi	6"	15"	2¼"
TD-15	18"	—	12"	90"	8" x 8"	37 gpm @ 1000 psi	5"	15"	2"

STEEL GREENVILLE CAR CO. EARTHMOVING EQUIPMENT

GREENVILLE
STEEL CAR COMPANY
Greenville, Pennsylvania

For more facts, use Request Card at page 18 and circle No. 378

Designed for any Caterpillar No. 12 or No. 14 motor grader with hydraulic power and operating valve, the Towner disk attachment handles a wide variety of operations.

One of the major advantages of the design, states the company, is that no changes are required on the motor grader. The attachment is made up of two gangs of blades that, when not being used, automatically close into an interlapped position as they are raised, with a minimum of overhang. When lowered on the two hydraulic rams, the forward travel quickly opens the gangs into operating position. The preset angle of the gangs ranges from 0 to 60 degrees as determined by "limit chains."

The unit is offered in two types—one for use on old oil surfaces and mixing aggregate, the other for a greater variety of aerating and mixing jobs.

Hydraulic lift on the grader blade is independent of hydraulic control of the disk attachment. The entire disk assembly can be quickly removed from the motor grader by pulling five pins.

For further information write to the Towner Mfg. Co., Dept. C&E, 2111 W. 17th St., Santa Ana, Calif., or use the Request Card at page 18. Circle No. 31.

New concrete bucket in sizes to 1 yard

A new Heltzel concrete bucket, called Econo-Bucket, features all-steel, all-welded construction and gear-controlled, double-arc clamshell gates with over-center self-locking mechanism and adjustable discharge control. According to the manufacturer, it is designed to handle all types of material from grout to dry mix.

The bucket is available in ½, ¾, and 1-cubic-yard sizes. Over-all height including bail is 4 feet 4 inches.

For further information write to the Heltzel Steel Form & Iron Co., Dept. C&E, Warren, Ohio, or use the Request Card at page 18. Circle No. 20.

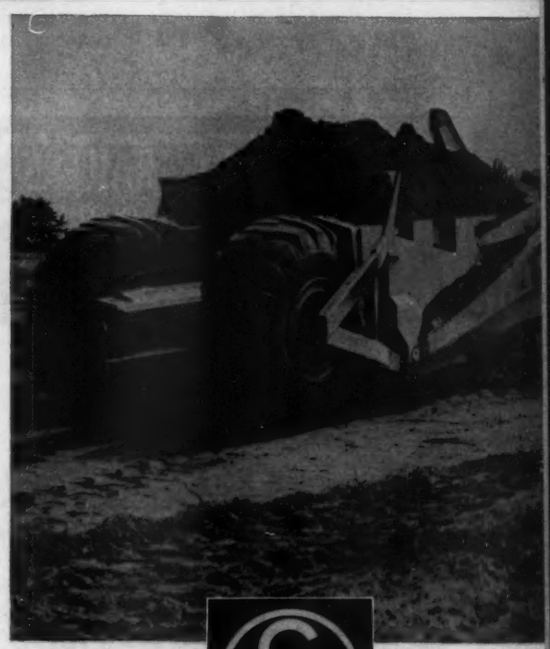
For more facts, use Request Card at page 18 and circle No. 379 ▶

With as much horsepower as the biggest bulldozer, the new Hiller E-4 helicopter is sister ship of the Hiller 12-E, one of the first in the light-utility class to be used in all stages of the construction of power lines, microwave installations, and other hard-to-reach high-altitude projects. Verified climb rate is said to be 820 fpm. Increased passenger capacity is another important feature. For further information write to the Hiller Aircraft Corp., Commercial Division, Dept. C&E, 1350 Willow Road, Palo Alto, Calif., or use the Request Card at page 18. Circle No. 59.

YARDS AHEAD

PRODUCTION

...Your Big 'Extra' With The Curtiss-Wright Line



Those extra yards you pack into each pass . . . the extra cycles per day . . . the extra profit you make from Curtiss-Wright's high output and low operating cost—This is what we mean by the "Yards Ahead" production of the Curtiss-Wright line. Throughout the country, from these scrapers shown working on a road job in the deep south, to the fleets of C-Ws handling tough excavation in the mountains of California, Curtiss-Wright scrapers are giving contractors *production unmatched by any other scraper.* You'll find this "Yards Ahead" production in every C-W model, from the 8 cu. yd. CW-28 to the tremendous CW-226. Check with your distributor on the model to meet your job requirements.

SOUTH BEND DIVISION

CURTISS-WRIGHT CORPORATION

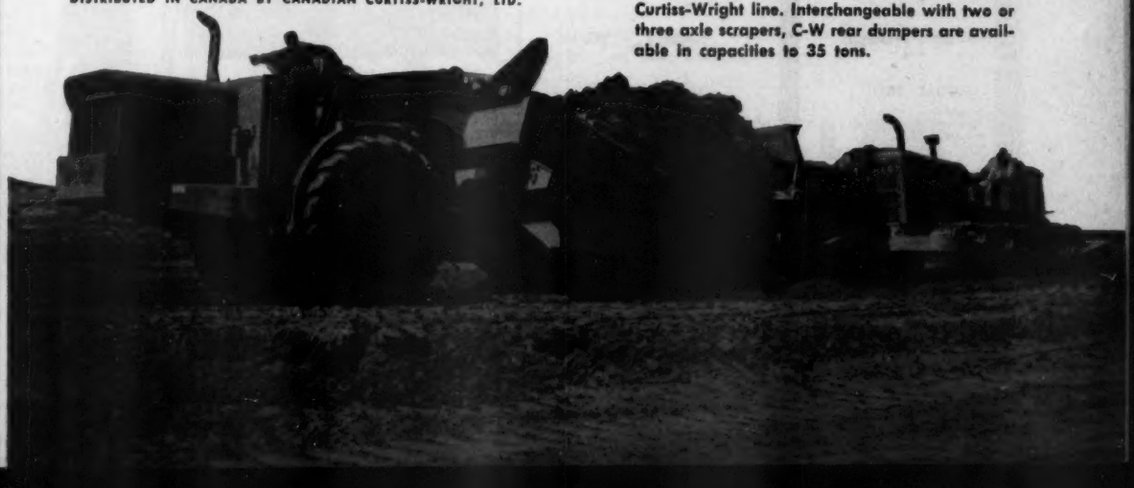
SOUTH BEND, INDIANA

DISTRIBUTED IN CANADA BY CANADIAN CURTISS-WRIGHT, LTD.

MODEL CWD-221

INTERCHANGEABLE REAR DUMPER

. . . one of the three rear dumpers in the Curtiss-Wright line. Interchangeable with two or three axle scrapers, C-W rear dumpers are available in capacities to 35 tons.



Because it is nonporous, with a water permeability in excess of 500 psi, Herculite 80 prevents most of the loss of live steam and moisture within forms and molds, providing favorable temperatures for curing.

Lightweight fabric cures concrete faster

Over the past two years Eau Claire Stresscrete, Inc., of Eau Claire, Wis., improved its method of steam-curing prestressed concrete while lowering costs through the use of efficient portable kilns made of a new lightweight synthetic fabric.

The fabric, an 18-ounce vinyl-laminated nylon called Herculite 80, successfully locked in both steam and heat during the curing of prestressed bridge girders, beams, and hollow-cored flat slabs built on recent Wisconsin state highway construction jobs. According to the manufacturer, the fabric also has good resistance to cold weather, and snow will not adhere to its surface.

The Herculite kilns reportedly can not be weakened by mildew and may be stored away, even wet, in little space. The fabric is said to be virtually impossible to tear; if punctures occur they will not spread into running rips. Repairs can be made in minutes with a patch kit supplied by the manufacturer. Herculite 80 is also flame-retardant and self-extinguishing.

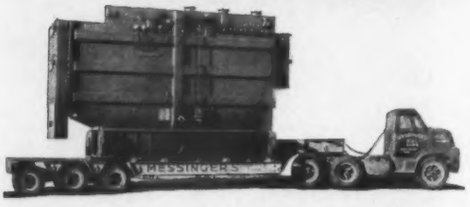
For further information write Herculite Protective Fabrics, Dept. C&E, 661 Fourth St., Newark 7, N. J., or use the Request Card at page 18. Circle No. 111.

TRANSPORT TRAILERS

OVER THE ROAD . . . ON THE JOB

PROVED

RUGGED • DEPENDABLE



TRIPLE-AXLE MODEL GTX

Positive equalization and distribution of weight on each axle is assured through this exclusive design. Six dual wheels with capacity of 30 through 60 tons. Flat or drop deck. Axles are tubular in type with heavy duty heat-treated alloy steel spindles ground to size to fit heavy duty tapered bearings. All axles are of standard production and have camber for longer tire life.

BUILT BETTER... TO LAST LONGER... TO GO FURTHER!

MODEL GTRY

Triple-axle, with or without removable gooseneck. Capacity 20 through 100 tons.

MODEL XTT

Tandem axle tilt trailer (tow type), capacities 13 through 30 tons.

MODEL GPX

Tandem axle. Capacities 16 through 40 tons. Drop deck or flat deck.

MODEL PTX

Heavy-duty tandem axle with adjustable bolsters. Telescopes from 16' to 30' from tractor.

MODEL PXO

Heavy-duty self-loading tandem axle oil field float.

MODEL GXTT

Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

"TRANSPORTATION ENGINEERING A SPECIALTY"

TRANSPORT TRAILERS pledge to "design better units to convey heavier loads farther at the lowest operating cost, longer."

TRANSPORT TT TRAILERS INC
CEDAR RAPIDS IOWA, U.S.A.

For more facts, use Request Card at page 18 and circle No. 330

Improved hoist features increase in capacity

The Tubular Structures Corp. of America announces an increase in the rated capacity of its Tusky hoist from 1,200 to 1,500 pounds. Other modifications include lateral bracing of the structural towers to handle the additional capacity. There is also an improved rail guide for the platform, as well as a new rail-guide field kit.

Not only do these two modifications provide greater stability when the concrete bucket is used in raising and dumping but they also provide greater over-all strength and rigidity, increased product longevity, and reduced maintenance, states the manufacturer.

For further information write to Tubular Structures Corp. of America, Dept. C&E, 2960 Marsh St., Los Angeles 39, Calif., or use the Request Card that is bound in at page 18. Circle No. 10.

YOU CAN'T OUTGROW A ROLCOR ROLLER

Whether your job is . . . Crease rolling . . . Driveways . . . Parking lots . . . Patching . . . Tennis courts . . . Sod rolling . . . Maintenance . . . you won't outgrow the usefulness of a Rollpac.

That's why thousands of contractors, landscapers, institutions and others make Rollpac their "number one" unit. One week on *your* job will prove to you why Rollpac is the top selling one-ton roller in the United States.

ROSCO MANUFACTURING CO.
ROLCOR DIVISION
3118 Snelling Ave. • Minneapolis 6, Minn.

For more facts, circle No. 381

For Better Highway Turf Maintenance...

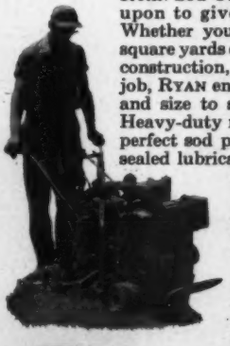
ENGINEERS INSIST ON FIELD-PROVEN Ryan EQUIPMENT

Engineers responsible for maintenance of right-of-ways, median strips, boulevards, parkways and other large grass areas insist on proved equipment that will do the job fast, efficiently, and without costly breakdowns.

They choose the RYAN RENOVAIRE to aerate turf damaged by winter-kill, erosion, and over-compaction. This ruggedly constructed renovator opens thousands of small holes in the soil to permit water, air, and fertilizer to reach the root zone. This cultivating action ensures maximum water penetration, encourages deep root growth and, consequently, prevents soil erosion.

Two tractor-drawn models are available. Both the 54" and the 96" sizes have individually suspended aerating wheels that hug the ground, regardless of its contour. Operating speeds up to 10 M.P.H. can be safely maintained. For maximum versatility, three styles of aerifying and cultivating tines are available. A hydraulic pump quickly raises aerating wheels to transport height for fast movement from job to job.

SOD CUTTERS

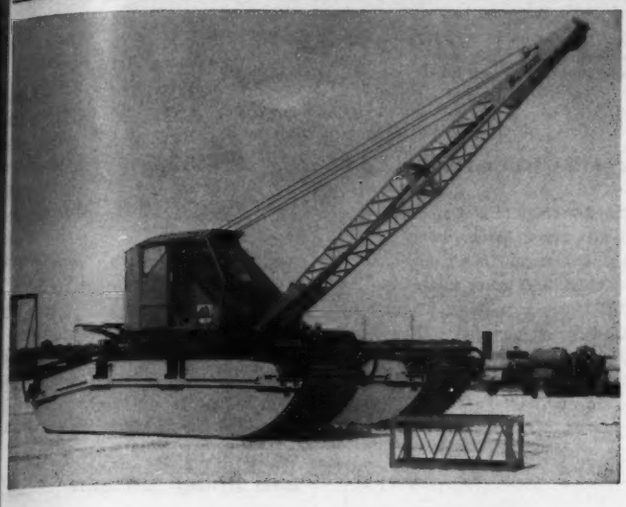


RYAN Sod Cutters can always be depended upon to give satisfactory performance. Whether your job calls for thousands of square yards of sod for highway or industrial construction, or just an occasional repair job, RYAN engineers have designed a model and size to suit your exact requirements. Heavy-duty models cut up to 300 sq. ft. of perfect sod per minute. Automatic cut-off, sealed lubrication, two-speed transmission, fingertip controls and, perfect balance are just some of the features that make the RYAN Sod Cutter the unquestioned leader in the industry.

Write for full particulars on these and other RYAN products and name of the nearest RYAN distributor.

Ryan LANDSCAPING EQUIPMENT COMPANY
871 EDGERTON STREET • ST. PAUL 1, MINNESOTA

For more facts, use Request Card at page 18 and circle No. 382



Available for any type of dragline, the amphibious undercarriage is of all-steel welded construction with aluminum cleated tracks.

Amphibious undercarriage announced for draglines

An amphibious, track-type undercarriage for all standard makes of draglines is available from the Quality Marsh Equipment Co., Inc. The unit is offered in two models. One is the independent and self-propelled type with a separate motor mounted in the rear; the other is driven by the dragline motor.

The manufacturer points out that the independently powered model functions as a marsh carrier when the dragline is not mounted. Capable of crossing canals, bayous, and streams, the unit is one-man operated.

It travels at a rate of from 3 to 5 mph on land, 3 to 4 mph in water. Turning radius is 40 to 50 feet.

For further information write to the Quality Marsh Equipment Co., Inc., Dept. C&E, P. O. Box 406, Thibodaux, La., or use the Request Card at page 18. Circle No. 44.

Chute for transit mixer controlled hydraulically

An electric hydraulic-controlled device that raises, lowers, or holds in any position the chute on a transit mixer is available from the Monarch Road Machinery Co., of Grand Rapids, Mich.

The one-man-operated unit, called Dyna-Chute, is said to be quickly and easily installed.

The Dyna-Chute is available as a complete control ready to install on all standard truck mixers. The assembly includes the 6 or 12-volt power unit with pressure pump, oil-reservoir case, and several other fittings. Weight of the entire assembly is approximately 90 pounds.

For further information write to the Monarch Road Machinery Co., Dept. C&E, 1331 Michigan N. E., Grand Rapids 3, Mich. Or else use the Request Card that is bound in at page 18 of this issue. Circle No. 28.

Device measures concrete in drum at any time

The Con-O-Mizer, a device designed to take the guesswork out of charging partly filled drums on transit mixers—enabling the operator to pour two or more small jobs accurately from a single batch—is announced by the Concrete Transport Mixer Co.

If a load of concrete is not completely used, the Con-O-Mizer tells how much to add to the next batch, thus making charging fast and accurate.

Con-O-Mizer kits are available for installation on mixers now in the field.

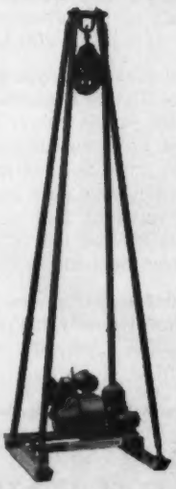
For further information write to the Concrete Transport Mixer Co., Dept. C&E, 4985 Fyler Ave., St. Louis, Mo., or use the Request Card at page 18. Circle No. 90.

YOUR FIRST NEED IN SOIL SAMPLING

AN

S&H PIPE DRIVING WINCH

INEXPENSIVE • LIGHTWEIGHT • ECONOMICAL



A Sprague & Henwood pipe driving winch is your first requisite for normal soil sampling operations. For shallow holes there is the Model PD, and for the deeper holes, the more rugged Model PDH. Both models are furnished with a tubular steel derrick with telescoping rear legs permitting 10' pulls. In addition to the skid mounting, there is also available a special trailer mounting that permits operation of the unit as either a skid or trailer-mounted unit. Write today for full particulars. Ask also for Bulletin #300 which illustrates and describes the complete S & H soil sampling line.

Look for our emblem... It's your Seal of Quality

SPRAGUE & HENWOOD, Inc.

SCRANTON 2, PA.

MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.

New York—Philadelphia—Nashville—Pittsburgh—Grand Junction, Colo.—Buchans, Nfld.
Export Division: Sprague & Henwood International Corporation, 11 W. 42nd St., New York, N.Y.

For more facts, use Request Card at page 18 and circle No. 383

BONDED BUY

NOW AT YOUR CATERPILLAR DEALER...

Big Bargains

IN USED EQUIPMENT!

Do you need extra equipment to finish that job before bad weather sets in? See your Caterpillar Dealer! He has the biggest selection of top values in town... nearly all makes, all sizes, all models, all conditions... priced to sell with financing tailored to meet your needs!

No guessing or gambling on your part. Your Caterpillar Dealer reconditions, classifies and warrants most of his used units. You know what you're getting... and you're protected... with these three types of buys:

1 **A "BONDED BUY"** Cat-built machine, the most productive used equipment you can buy. Carefully checked, it is backed by his written bond up to $10,000, assuring you parts and service protection for the warranty period.

2 **A "CERTIFIED BUY"**—a written warranty covering units of any make in good condition.

3 **A "BUY AND TRY"** deal—a written money-back agreement on machines not in the above two classifications.

Only a Caterpillar Dealer will provide you with "Bonded Buy" protection. He backs his machines with prompt service and parts you can trust. Look him up in the Yellow Pages... look over the machines in his used equipment lot. You'll find the best buys in the market there!

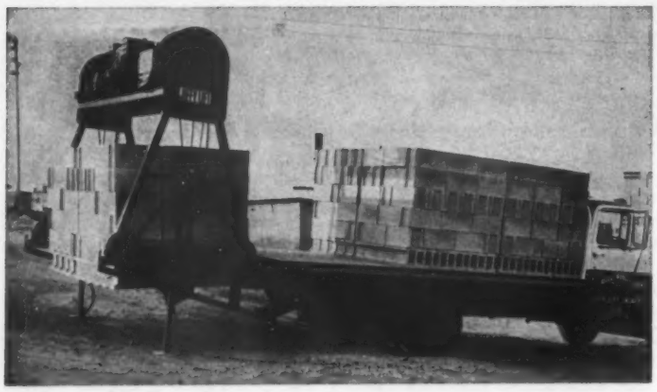
Caterpillar Tractor Co., General Offices, Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST USED EQUIPMENT BUYS ANYWHERE

For more facts, use Request Card at page 18 and circle No. 384



The Jiffy-Lift loads up to 10,000 pounds of concrete blocks, stones, bricks, pipe, cement, steel shapes, and almost any other heavy and bulky material.

Versatile truck loader handles 5-ton loads

The Elberfeld Mfg. Co. offers the Jiffy-Lift truck loader-unloader for handling concrete block and many other bulky and heavy materials.

This 10,000-pound-capacity unit is completely self-powered with a 9-hp Briggs & Stratton engine that operates the hydraulic lift and drive mechanisms.

The one-man-operated Jiffy-Lift is easily installed on all standard truck beds and can be quickly removed for self-propelled off-truck operations.

For further information write to the Elberfeld Mfg. Co., Dept. C&E, Elberfeld, Ind., or use the Request Card at page 18. Circle No. 73.

Combination dump bed and lifting tail gate

A flat-bed dump with a lifting tail gate mounted on the curb side is announced by the H. S. Watson Co.

The elevating gate is known as the Watson Hide-A-Gate. It folds up underneath the body when not in use, permitting easy access to the body for hand loading. The Hide-A-Gate has 1,200 pounds capacity and is electric-hydraulic to permit it to operate independently from the PTO-driven dump body.

For further information write to the H. S. Watson Co., Dept. C&E, 1316 67th St., Emeryville 8, Calif., or use the Request Card at page 18. Circle No. 23.

Announce new line of compaction rigs

Thunderbird Engineering, Inc., offers a new line of compaction equipment.

Available are four sizes of self-propelled pneumatic rollers, a 50-ton pneumatic compactor, and the Crusher-Pak, as well as pull-type

For a better profit picture...
CHECK EUCLID C-6 WORK-ABILITY

You'll find this new C-6 has the all-around tractor versatility needed for heavy construction, mine and quarry work. With five years of rugged field and proving ground test, this new crawler sets higher standards of performance on the toughest jobs for tractors in the 200 h.p. class.

Here are just a few advantages you get in the C-6... a dependable GM 6-71 engine delivering 211 net h.p. to the power train... a proven Torqmatic Drive that provides full-power shift and cuts cycle time... fast-as-a-fox maneuverability... almost unbelieveable ease of handling ... accessibility for servicing that pays off in more productive time on the job. It responds like nothing you've ever touched!

Have your Euclid dealer give you all the facts on the C-6... he'll show you why this new "Euc" belongs in your spread... why it's your best equipment investment.

EUCLID Division of General Motors • Cleveland 17, Ohio

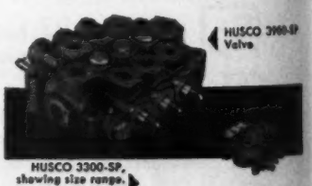
GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

For more facts, use Request Card at page 18 and circle No. 385

Why **HUSCO HYDRAULIC MULTI-PLUNGER VALVES** *fit a greater range of control needs . . .*

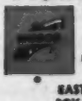


HUSCO 3300-SP, showing size range.

- Choice of FIVE Basic Model Sizes — over 120 standard valves for unlimited modifications to specific needs.
- Control up to SIX Cylinders, single or double acting.
- Up to FOUR Standard Control Positions — raise, lower, float and neutral.
- Available with Flange or Standard Mounting (3900 Valves only).
- Accurately Rated Capacities from 3 to 185 G.P.M. at 22 f.p.s. velocity.

These are only a few reasons why HUSCO Valves are more flexible in adaptation to your needs, more efficient in power-saving control.

Write for detailed specifications on HUSCO 3300-SP and complete catalog "Husco's House of Ideas" — or engineering aid on your hydraulic control needs.



HYDRAULIC UNIT SPECIALTIES CO.

PUMPS • VALVES • CYLINDERS

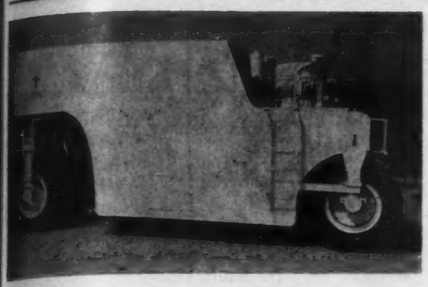
P. O. Box 257-E, Waukesha, Wisconsin

West Coast Representatives

EASTMAN PACIFIC CO., Los Angeles, Calif.

ROY ROBBS AIR-DRAULIC CO., Portland, Ore.

For more facts, circle No. 386



Offered in the new Thunderbird Engineering line, the Model 11-VVS 25-ton self-propelled pneumatic roller individual vertical wheel oscillation and Revers-O-Matic torque-converter transmission, with gasoline or diesel power.

pneumatic and sheepsfoot rollers.

For further information write to Thunderbird Engineering, Inc., Dept. C&E, 2811 Dawson Road, Tulsa 10, Okla., or use the Request Card at page 18. Circle No. 108.

New 44-inch power trowel offered for large jobs

A 44-inch gasoline-engine-powered concrete-finishing trowel is announced by the Remington Arms Co., Inc.

A 4-blade model, the T-444 is powered by a 5¾-hp Briggs & Stratton engine and incorporates wall-to-wall working action by means of fixed guard rings. Blade-pitch controls, engine controls, and positive manual clutch control are all located at the handle bar.

Blades are of the combination floating and finishing type, 8 × 17½ inches, and optional reversible floating blades and reversible finishing blades are available.

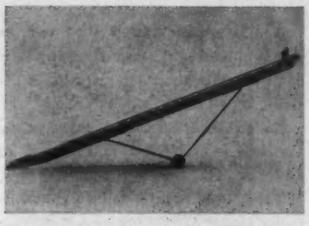
For further information write to the Remington Arms Co., Inc., Dept. C&E, 939 Barnum Ave., Bridgeport, Conn., or use the Request Card at page 18. Circle No. 65.

Offer portable conveyors in lengths to 81 feet

A new, long-reach series of portable belt conveyors, available in 18, 24, 30, and 36-inch belt widths, and in lengths of 69, 75, and 81 feet, has been announced by the Barber-Greene Co.

The series is identified as PA-80, and capacities are said to range from 155 to 630 tph.

Structural features include an extra-heavy-duty V-truck equipped with pneumatic tires and swivel wheel mounts, permitting use of the conveyors in radial stockpiling applications; V-belt drive from electric-motor power unit to head-end-mounted torque-arm drive; and a



hydraulic boom hoist with full power-operated hydraulic hoist as an option.

For further information write to the Barber-Greene Co., Dept. C&E, 400 N. Highland Ave., Aurora, Ill., or use the Request Card at page 18. Circle No. 22.

"Shear-Ball" connection eliminates adjustments, boosts output

In this unique design a single row of balls holds turntable to mounting — allows it to revolve smoothly, freely, steadily, year after year. There are no center pins, center pin nuts, centering gudgeons, rollers, bushings, exposed roller paths to be lubricated and adjusted frequently. Even in constant rock digging there is no bounce or wobble.

10-year warranty. "Shear-Ball®" has proven so reliable in ten years of field use on many hundreds of machines that Lorain now warrants the "Shear-Ball" for 10 years against failure to function in normal use and service.

Contractors report: "During two years of operation we never touched 'Shear-Ball' mountings except to lubricate them. Yet our other hook roller and center-pin types have been in the shop for new rollers, bushings and pins."

"As far as maintenance is concerned, there is no comparison between 'Shear-Ball' and any other type of mountings . . . before 'Shear-Ball' we spent $7,000 to $8,000 for rollers, bushings and cracked frames."

"The single ball race design gives us a more compact machine to get under lower bridges."

You too can have this kind of performance. See your Lorain shovel and crane distributor or write direct and ask for the "Shear-Ball" booklet that gives a full explanation of this unique feature.

THE THEW SHOVEL COMPANY, LORAIN, OHIO

LORAIN. ON THE MOVE

PLANTS: In Lorain, Elyria and Bucyrus, Ohio . . . **PRODUCTS:** Power shovels, draglines, clamshell, and hoes from ⅜-yard to 2½-yard capacity • Cranes from 7 to 80 tons . . . on crawlers, and as rubber-tire Moto-Cranes, and Self-Propelled Cranes • Rubber tire front-end Moto-Loaders in 6000-lb. and 7000-lb. carrying capacity . . . **OUTLETS:** Lorain products are sold and serviced by 249 distributor outlets throughout the world.

For more facts, use Request Card at page 18 and circle No. 388

WET JOB?
whether
POWER PLANT

or other wet work—
for "quick dry"...specify...

GRIFFIN
WELLPOINT CORP.
SALES • RENTAL • CONTRACT
881 E. 141st St., New York 54, N. Y.
Hammond, Ind. Jacksonville, Fla.

For more facts, circle No. 387

Submersible pump is easily serviced

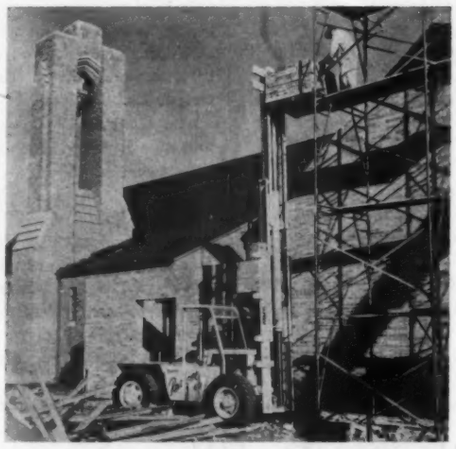
A submersible pump that can be disassembled and serviced in the field with three ordinary hand tools is offered by Clayton Mark & Co.

Called Silver Triton, the new pump has an outer jacket and screen of stainless steel.

The pump is designed so that impeller stages are driven by a stainless-steel shaft with six splines.

The pump is available in 1/3-hp to 3-hp sizes.

For further information write to Clayton Mark & Co., Dept. C&E, 1900 Dempster St., Evanston, Ill., or use the card at page 18. Circle No. 89.



A new triple-stage upright that provides a 30 per cent increase in lifting height over a standard upright is available for use on the Clark Ranger 60 outdoor fork truck. Standard triple-stage uprights are available with maximum fork heights ranging from 126 to 216 inches. Higher fork heights may also be obtained. Over-all height of the upright when lowered ranges from 79½ to 111½ inches, and over-all height raised is 157 to 247 inches. For further information write to the **Clark Equipment Co.**, Industrial Truck Division, Dept. C&E, P. O. Box 31, Battle Creek, Mich., or use the Request Card at page 18. Circle No. 3.

Bamboo slide rule comes in two models

A laminated bamboo slide [rule] said to provide self-lubricating [qual]ities, plus shrink and warp [resist]ance, is available from the [Texas]-Asiatic Import Co.

The unit is 10 inches long [when] it has scales that give the equiv[alent] accuracy of an 80-inch rule, [says] the manufacturer.

The rule is provided with a [leather] case and an instruction book. A [20]-inch model is also available.

For further information write to the Texas-Asiatic Import Co., Dept. C&E, 2127 Fort Worth Ave., Dallas 11, Texas, or use the Request Card at page 18. Circle No. 30.

CUT ROAD BUILDING COSTS with the CARVER LABORATORY PRESS

This versatile, hydraulic Press quickly repays its cost in all kinds of pressing tests. The testing of native materials for more economical Road-base construction is only one example of the possible savings through laboratory research with the Carver Laboratory Press.

Compact, self-contained, this press provides controlled pressures to 20,000 lbs. Interchangeable accessories are available for

• CRUSHING TESTS • BRIQUETTING
• BREAKING TESTS • SHEAR TESTS
• BENDING TESTS

FRED S. CARVER INC.
HYDRAULIC EQUIPMENT
7 CHATHAM ROAD, SUMMIT, N. J.

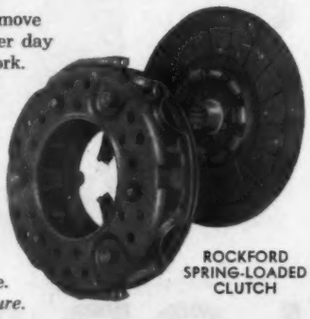
Send catalog, describing Carver Laboratory Press and Standard Accessories.

NAME .....
FIRM .....
ADDRESS 113

For more facts, use coupon or circle No. 389

HAULING PROFITS UP
with Rockford Spring-Loaded Clutches

Rockford Clutch equipped trucks move thousands of tons of limestone per day in construction and quarrying work. Here, higher power means higher profits. That's exactly what you get with Rockford Spring-Loaded Clutches — positive, full-motion driving power with cushioned starts and controllability. These rugged clutches are also used on haulers, loaders, graders, tractors and other vehicles where the clutch is in constant use. *Write today for illustrated brochure.*



ROCKFORD SPRING-LOADED CLUTCH

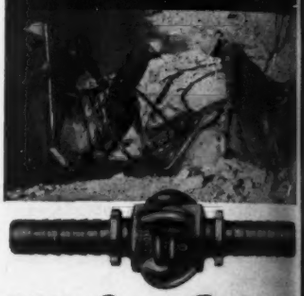
ROCKFORD CLUTCHES
ROCKFORD CLUTCH DIVISION BORG-WARNER

314 CATHERINE ST.
ROCKFORD, ILLINOIS

Export Sales
Borg-Warner International
36 So. Wabash, Chicago, Ill.

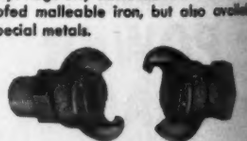
For more facts, use Request Card at page 18 and circle No. 390

"AIR KING"



FOR *Quick, Pressure Proof Connections* ON AIR HOSE AND COMPRESSORS . . .

"Air King" Quick-Acting, Universal Type Coupling. Built on plain, rugged lines to assure long trouble-free service under all conditions. Locking heads identical for all sizes of hose or threaded ends within the "Air King" size range. To connect, press together and apply quarter-turn. Reverse to disconnect. Equipped with auxiliary locking device for added safety. Regularly furnished in bronze or rust-proofed malleable iron, but also available in special metals.



Made in Hose Ends and Male and Female I. P. T. Ends, in sizes up to 1".

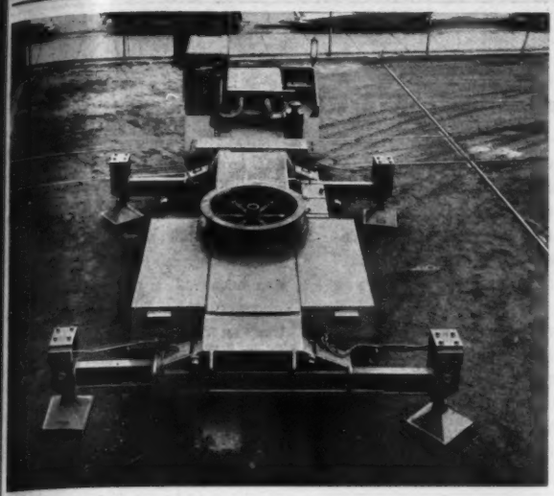
FOUR-LUG STYLE

Same as above in locking action, but for larger hose sizes. Hose ends and I. P. T. Ends in sizes 1¼", 1½" and 2".

Stocked by Manufacturers and Distributors of Mechanical Rubber Goods

DIXON Valve & Coupling Co.

For more facts, circle No. 391



These hydraulically operated outriggers are optional equipment for B-E transit crane-excavators.

Hydraulic outriggers for crane-excavators

Hydraulic outriggers are now optional equipment for all Bucyrus-Erie transit crane-excavators.

Horizontal travel of the beams, as well as vertical movement of the leveling jacks, is hydraulically powered. Hydraulic jacks rest on easily removable swivel-mounted floats.

The outriggers are independently operated from the ground through six valve controls located on the left side of the carrier frame at the rear of the carrier cab. Four of the valves control the vertical motion of the jacks. The remaining two valves control the horizontal extension of front and rear outrigger beams.

These transit machines are also available with manually extended horizontal outriggers or with screw-type jacks and aluminum floats.

For further information write to the Bucyrus-Erie Co., Dept. C&E, South Milwaukee, Wis., or use the Request Card at page 18. Circle No. 71.

Six new power trowels feature easy operation

The Kelley Machine Division of the Wiesner-Rapp Co., Inc., offers a line of six new power trowels: the portable 24-inch Bantam; the 29-inch Big Boy; the 34-inch Chief; the 44-inch Commander; and 34 and 44-inch Hydra-Trowels.

These units are said to have low centers of gravity for easy, stable operation, with no pulling or tugging on the operator.

A stationary guard ring permits working right next to walls or columns and provides a strong and convenient carrying method.

For further information write to the Kelley Machine Division, Wiesner-Rapp Co., Inc., Dept. C&E, 285 Chicago St., Buffalo 4, N. Y., or use the Request Card at page 18. Circle No. 12.

MINIATURE 2-WAY RADIO SYSTEM lets you SPEAK and be HEARD under ANY NOISE CONDITIONS!

the SEISCOR TELEPATH . . . is a portable industrial-type communications system that becomes a part of your wearing apparel. Crystal-controlled circuit plus noise-cancelling mike and earphones make it the best way to communicate in poor visibility or high noise conditions!

- Fully transistorized printed circuit
- Crystal-controlled superheterodyne receiver
- Crystal-controlled transmitter
- Long battery life
- For any single frequency between 28-55 mc., A.M.
- No license required on 27 mc. units.
- Priced from $350.00 per unit.

MODEL HR Hardhat with built-in transceiver, antenna, earphones and mike. High and low noise level models available.

MODEL BR Belt-clip transceiver and headset with built-in antenna, earphones and mike. High and low noise level models available.

Let Seiscor Engineers analyze your short-range communications problems. Example: Special units have been designed into protective clothing for crash-crew fire fighters.

FIND OUT TODAY HOW TELEPATH CAN IMPROVE YOUR SHORT RANGE COMMUNICATIONS!

Write for name of nearest TELEPATH dealer, and complete information on versatile TELEPATH communications.

SEISCOR
A DIVISION OF SEISMOGRAPH SERVICE CORPORATION
BOX 1590, TULSA, OKLAHOMA

For more facts, circle No. 392

ALL-NEW HEAVY-DUTY BREAKER

From throttle to tool retainer, this 80 lb. class Worthington Blu-Brute paving breaker is all-new. It takes both spike and sheeting driver. And it's designed to give faster breaking with better operator control and less maintenance.

How? There's more than a dozen improved design features. They range from an easy operating progressive throttle valve to simplify starting moils through to a renewable front head bushing for low cost replacement of the wearing part of the chuck housing. Other features mean less operator fatigue . . . for example, the extended "steel run."

In addition, the WB-82 wears better because of the exclusive Worthington process: Blu-Coated parts.

The Blu-Brute paving breaker line is complete from the 20 through 80 lb. classes. See your nearest Worthington distributor for more information about the new WB-82. Or request bulletin from Worthington Corporation, Dept. 60-28, Holyoke, Massachusetts.

WORTHINGTON

For more facts, use Request Card at page 18 and circle No. 393

81 hydraulic models to choose from!
THE WORLD'S MOST COMPLETE LINE

SIMPLEX
HYDRAULIC JACKS and PULLERS

STANDARD HYDRAULIC JACKS
11 Models
1½ to 100 tons capacity
5¼" to 22" travel

"JENNY" CENTER-HOLE HYDRAULIC PULLERS
6 Models
30 to 100 tons capacity
3¼" to 10" travel

ROL-TOE FOOT-LIFT HYDRAULIC JACKS
3 Models
10 to 50 tons capacity

RE-MO-TROL PULLERS
Solid and Center-Hole Rams
39 Models
10 to 300 tons capacity

HYDRAULIC SERVICE and BUMPER JACKS
9 Models
1¼ to 20 tons capacity
13½" to 19" travel

HYDRAULIC PULLERS
4 Models
20 and 30 tons capacity
Push-Pullers, Double and Triple-Grip Pullers

POWERED PUMPS ELECTRIC, GAS OR AIR—6 Models

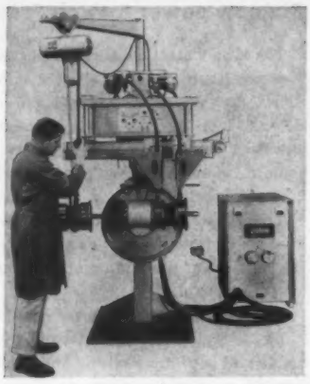
HAND PUMPS
3 Models

Look for further information on Lever and Screw Jacks in other advertisements.

Write for catalog: Hydraulic 60

TEMPLETON, KENLY & CO.
2511 Gardner Road
Broadview, Illinois

For more facts, use Request Card at page 18 and circle No. 394



The Victor Model B hardfacing machine for the automatic rebuilding of tractor rollers and idlers handles two rollers or idlers at a time.

Machine for rebuilding tractor rollers, idlers

A new machine for the automatic rebuilding of tractor rollers and idlers is announced by the Victor Equipment Co.

Designated Model B, the unit is designed primarily for the smaller repair shop and mounts two rollers or idlers.

A built-in jib crane, rated at ¼-ton capacity, enables the operator to position rollers and large idlers with ease. The modular design of electronic controls simplifies maintenance and trouble shooting.

Standard equipment includes constant potential, single console, dual 500-amp, 100 per cent duty cycle power source, and caster-mounted flux buggy.

For further information write to the Victor Equipment Co., Dept. C&E, 844 Folsom St., San Francisco 7, Calif., or use the Request Card at page 18. Circle No. 11.

at last...a construction heater with

no odor!

White Heat

no exposed flame!

All portable heaters are *not* alike. Lowell Shaum, electrical contractor, learned that in a single day. "Fumes from a new construction heater about got my men down," said Shaum. "Especially when they worked near the ceiling. Luckily, I was able to return it. Now we have a WHITE. What a difference! There's no odor at all." WHITE construction heaters now available in three sizes, cost no more than those that "belch" fumes and fire.

THE SECRET OF WHITE'S ODOR-FREE PERFORMANCE—Flame passes through stainless steel sleeve, then back through outer sleeve for more efficient combustion. Fumes, odors are actually "burned out."

Note furnace-type blower. No fans. No exposed flames.

DON'T BUY ANY HEATER UNTIL YOU'VE TRIED WHITE—Learn, as hundreds have, how truly odor-free a WHITE heater is. Ask your dealer for a free demonstration. If he doesn't have WHITE heaters in stock, ask him to wire for priority shipment *subject to your approval*. WHITE heaters are a product of White Manufacturing Company, specialists in construction equipment since 1925.

White MANUFACTURING COMPANY

MAIL COUPON FOR TRIAL OFFER

ELKHART 9, INDIANA

Please rush catalog on new WHITE construction heaters.

name

address

city state

name of favorite dealer

For more facts, use coupon or circle No. 395

Earth auger drills 8-inch-diameter holes

First in a new series of Pengo earth augers is Model AA69, capable of drilling holes 8 feet in diameter.

Planned for use on the most powerful drilling machines available, the new AA series augers feature extra-heavy-duty design throughout, according to the manufacturer.

Attachment hubs are designed for 5-inch kelly bars, but may be adapted to 3½, 4, or 4½-inch bars by means of Pengo bushings. AA series augers also feature the firm's new heavy-duty Model 20A70 replaceable, reversible tooth, said to be substantially heavier in section, wider, and longer than the 16A50 tooth currently used on Pengo heavy and medium-duty augers and boring heads.

For further information write to the Peterson Engineering Co., Inc. Dept. C&E, P. O. Box 330 A, Santa Clara, Calif., or use the Request Card at page 18. Circle No. 83.

FOR THE BIG SHAKE*

"World's Quietest Vibrators"

hopper cars
massive bunkers
large bins
silos
chutes
shake-outs

MOVES, FEEDS, SIFTS
sand
clay
coal
ore
other materials

VIBROLATOR

VIBRATION INDUCERS

*VIBROLATOR CCVP-3000, the 6600-lb. impact vibrator — or one of its three smaller brothers — IS GUARANTEED TO DO YOUR JOB OR YOUR MONEY BACK.

Order from your distributor today, or write for complete catalog.

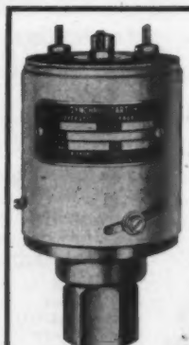
MARTIN ENGINEERING COMPANY

Largest Producer of Rotary Vibrators

155 Engine Street, Neponset, Illinois

● VIBROLATOR is Martin Engineering's registered trade mark for vibration inducers and vibrator accessories.

For more facts, circle No. 396

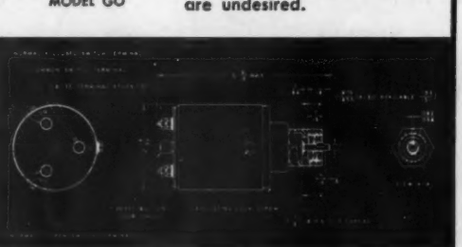


MODEL GO

SPEED SENSITIVE SWITCHES

That can be furnished to trip at any given speed between 300 and 6000 R.P.M.

These switches have single pole, double throw, snap-acting contacts rated for 10 Amps at 115 V.A.C. A variety of dust covers and electrical connectors are available if exposed terminals are undesired.



SYNCHRO-START PRODUCTS, INC.

8151 N. RIDGEWAY AVENUE • SKOKIE, ILL.

For more facts, circle No. 397

...for easier, safer, more economical welding...

FULLY INSULATED

The NEW, ... SuperGun ELECTRODE HOLDER

4 MODELS:

A-M Aluminum 300 Amps. ¼" rod
C-S Copper 250 Amps. 5/32" rod
C-M Copper 300 Amps. ¼" rod
C-L Copper 500 Amps. 5/16" rod

Ask for Bulletin No. 65

OUTSTANDING FEATURES:

1. Rugged, long-wearing, interchangeable insulators.
2. Powerful spring for extra "bite" in ...
3. Ball-point set screw grips cable for ... current density.
4. Exclusive "necked-down" handle ... fatigue at handle and cable connection.

THE FIBRE-METAL PRODUCTS CO.

CHESTER, PENNSYLVANIA

In CANADA: *Fibre-Metal (Canada) Limited, Toronto*

For more facts, circle No. 398

With the Model 130 portable belt conveyor, interchangeable traps, hoppers, and feeders can be added on the job.

Portable belt conveyor in lengths to 70 feet

A new heavy-duty portable belt conveyor has been announced by the Atlas Conveyor Co.

The Model 130 combines with vibrating screens, traps, feeders, and hoppers to make a complete portable screening plant, which can be towed from one job site to another without any dismantling.

Some of the design features of this new model are: low road clearance, hydraulic hoist, positive boom locking pins, shaft drive that allows easy access to engine, fixed or swivel axles, and V-type cradle truck.

The Model 130 is available in belt widths of 18, 24, 30, 36, and 42 inches. Standard lengths are 40, 50, 60, and 70 feet. A wide selection of vibrating screens and accessories is available.

For further information write to the Atlas Conveyor Co., Dept. C&E, P. O. Box 59, Clintonville, Wis., or use the card at page 18. Circle No. 81.

Soil-sampling machine doubles as fence puller

A new machine for shallow hole boring and soil sampling is announced by the Giddings Machine Co., of Fort Collins, Colo.

A one-man-operated unit, the machine is said to be an effective time and work saver as a steel and wood-fence post driver and puller. It is hydraulic-powered, and it features a reclining mount that lays the machine flat on the bed of a pickup truck for compactness and better road stability.

Designed to core to a depth of 10 feet in 60 seconds, the Giddings soil-sampling machine can be easily attached to any truck or tractor equipped with power takeoff.

According to the manufacturer, it can core to a depth of 10 feet in 60 seconds, and—with rotating-type augers or tubes—it can cut through gravel, loose rock, and sandstone to depths of 20 feet or more. A rotary attachment permits using auger or probe-type tools on the same head.

Light in weight, it is easily attached to any truck or tractor with power takeoff. A choice of four types of mountings is available: rear tail-gate mount, side mount, rear tractor mount, rear well mount.

For further information write to the Giddings Machine Co., Dept. C&E, 401 Pine St., Fort Collins, Colo., or use the Request Card at page 18. Circle No. 69.

GALION®
Vibratory Compaction...
UNITS

With the GALION 3-WHEEL ROLLER VIBRATORY COMPACTOR combination, you not only attain specified densities of granular materials, but you also can achieve effective compaction of the many soils which respond best to a static weight roller. In addition, the 3-Wheel Roller can be used for the compaction of finish surface materials. This multi-purpose usage multiplies the profit possibilities on your roller investment.

●

With the GALION Model 503 GRADER-VIBRATORY COMPACTOR combination it is possible to spread, level, and compact the material—all in ONE operation or separately as the situation may demand. The vibrating unit is raised hydraulically for speedy travel on, to and from the job. The profit possibilities of this combination are not limited to one function. Vibrating Compactor unit is easily removed to permit other grader operations such as ditching, blading, windrowing, etc.

With the GALION Grader or Roller and Vibratory Compactor combination you SAVE—on equipment cost, labor costs, operating costs and overhead costs.

doubly useful- doubly profitable

ELECTRIC VIBRATORY COMPACTOR FEATURES

- **Delivers up to 4200 three-ton, deep-penetrating compacting blows per minute.**
- **Vibratory Compactor can be operated with Roller or Grader traveling forward or reverse.**
- **Compacted surface is smooth and flat—no waves or "washboard" effect.**
- **Roller and Grader are protected against vibration of the compactors which FLOAT on the surface.**
- **Power unit (engine and generator) for compactor can be used as an emergency lighting plant or for the operation of small power tools.**
- **Individual compactor shoes can be detached and fitted with operating handle for compacting confined spots others can't reach.**

THE GALION IRON WORKS & MFG. CO.
General and Export Offices
Galion, Ohio, U.S.A.
Cable Address—GALIONIRON, Galion, Ohio

GALION® ESTABLISHED 1907 **MOTOR GRADERS • ROLLERS**
VIBRATORY COMPACTORS • PNEUMATIC TIRE ROLLERS

THE GALION IRON WORKS & MFG. CO. Date_____
Dept. CE-90, Galion, Ohio
Please send me complete information on ☐ 3-Wheel Roller with Vibrator ☐ Model 503 Grader with Vibrator
Name_____ Title_____
_____
City_____ State_____

For more facts, use coupon or Request Card at page 18 and circle No. 399

The new Rogers X-Tendible trailer is shown moving a prestressed-concrete bridge beam 58 feet long and weighing 18 tons.

New flat-bed trailer with extendible deck

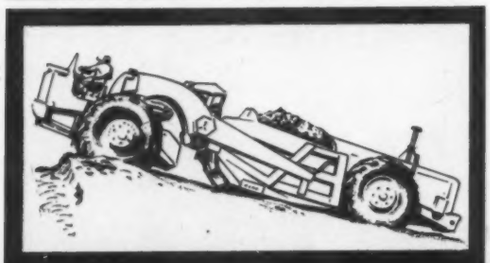
A new flat-bed extendible trailer with an X-braced I-beam frame is available from the Rogers Bros. Corp.

Known as the X-Tendible high-flat, the unit is especially recommended for transporting prestressed beams, booms, stacks, and other long objects. Its deck stretches from a length of 35 feet closed to 55 feet extended. According to the manufacturer, there is no binding or sagging even when the body is completely extended, and no center jack is necessary for closure.

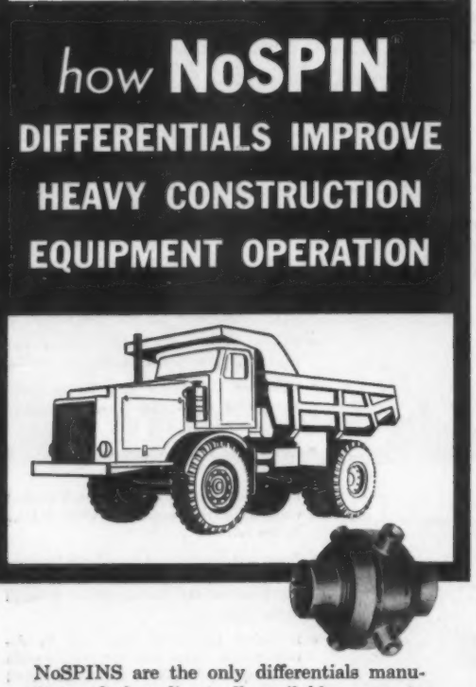
Other features include lightweight axle suspension for freedom of [illegible] movement in turns, as well as [illegible] force brakes with 7-inch shoes.

The company points out that the deck-shortening feature cuts the number of "special-permit hauls" in half when the trailer goes out with an oversized load and returns empty and closed to its 35-foot legal length.

For further information write to the Rogers Bros. Corp., Dept. C&E, 108 Orchard St., Albion, Pa., or use the Request Card at page 18. Circle No. 33.



how NoSPIN DIFFERENTIALS IMPROVE HEAVY CONSTRUCTION EQUIPMENT OPERATION



NoSPINS are the only differentials manufactured that direct all available power to drive wheels having traction—giving full-time equipment control. NoSPINS automatically permit differences in wheel speeds when required for making turns or negotiating obstructions in a forward or rearward direction.

NoSPINS ARE EASY TO INSTALL—no special tools needed. NoSPINS ARE ECONOMICAL—you can obtain them from your dealer or specify them on your original equipment.

WRITE TODAY FOR
COMPLETE DESCRIPTIVE LITERATURE
862 A

DETROIT AUTOMOTIVE PRODUCTS CORPORATION
Manufacturers of THORNTON Four-Rear-Wheel DRIVES, NoSPIN Differentials and Super LOAD-BOOSTER third axles
8705 GRINNELL AVENUE DETROIT, 13, MICHIGAN, U. S. A.

For more facts, circle No. 400

Torque steering booster for motor graders

A torque steering booster to fit Adams motor graders (Models No. 312, 414, 512, and 550) and Allis-Chalmers motor graders (Models AD-3 and AD-4) is offered by Rivinius, Inc.

Reported to be easily and quickly installed, the lightweight unit mounts high above dust, dirt, and moisture. The manufacturer points out that the few moving parts contained in the steering booster assure a minimum of maintenance.

For further information write to Rivinius, Inc., Dept. C&E, 602 W. Center St., Eureka, Ill., or use the Request Card at page 18. Circle No. 15.

Vibratory compactor is one-man operated

The Masher, a heavy-duty vibratory compactor, is offered by the Muller Machinery Co., Inc.

This equipment is available with three sizes of tamping pads: the M12, the M18, and the M24 have 12, 18, and 24-inch pads, respectively. The machine is self-propelled and is designed for one-man operation.

Heavily constructed throughout, the Muller Masher features a large eccentric weighted rotor said to produce a compacting force equal to a 10-ton roller. It travels at speeds of 50 to 75 fpm.

For further information write to the Muller Machinery Co., Inc., Dept. C&E, P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 6.

NEW detachable ALL-weather CAB for Model H-30 PAYLOADER

Enables your operator to work comfortably in all kinds of weather. Approved design for this new Payloader; fits perfectly, made of heavy gauge sheet steel and angle iron frame. Full vision SAFETY GLASS windows, mounted in rubber, right side and rear windows slide open for ventilation. Hinged door for easy access, may be removed for summer operation. Optional accessories include wind-shield wipers, heater-defroster, sun visor and rear view mirror. Campbell cabs are specifically designed for all Payloader models—see your Payloader distributor or write direct.

CAMPBELL detachable cab company
WAUCONDA, ILL.

For more facts, circle No. 401

CUT COLD WEATHER COSTLY DELAYS WITH

KIM HOTSTART
Electric Pre-Heater for Diesel and Gasoline Engines

Equipment kept warm between operating periods, ready for instant action. Ideal for units with Torque Converters. KIM prevents cold weather damage; reduces wear and costly down-time. Plugs into electric circuit; draws off cold water from engine; heats and circulates it through engine. Approved and used by all major engine manufacturers.

SEE YOUR DEALER or write for free literature:

KIM Hotstart

KIM HOTSTART MANUFACTURING COMPANY
West 917 Broadway Avenue, Spokane 1, Washington

For more facts, circle No. 402

Versatile new machine for bituminous curb

The Model 60 lays curb to a maximum height of 6 inches and a maximum width of 8½ inches, at a rate up to 4 fpm, within 1 inch of obstructions.

The Model 60 bituminous-curb machine is announced by the F & H Products Co.

Bituminous material is loaded into the hopper of the machine and carried by a screw conveyor into a mold chamber where it is compressed and shaped to any contour desired—to 6-inch maximum height and 8½-inch maximum width. The machine will lay up to 4 feet of curb per minute, and within 1 inch of any obstruction.

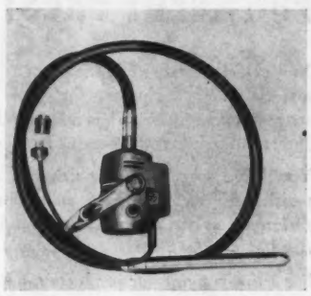
The Model 60 weighs only 340 pounds, and its over-all dimensions are 32 inches high, 63½ inches long, and 19 inches wide, including handle.

For further information write to the F & H Products Co., Dept. C&E, 1531 Washington Ave., Piqua, Ohio, or use the Request Card at page 18. Circle No. 19.

Electric vibrators handle tight work

Two new flexible-shaft electric concrete vibrators, the Thor ELV-5 with 5 feet of flexible shaft and the ELV-10 with 10 feet, have been added to the line of the Construction Equipment Division, Thor Power Tool Co.

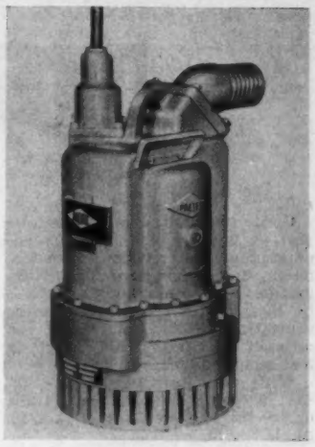
The units are available in head sizes of 1, 1¼, 1½, and 1¾ inches. They are designed for working concrete in small-access or tightly reinforced sections, narrow walls, small slabs, beams, sills, steps, etc.



Both vibrators are powered by a 1-hp universal electric motor and produce an impact of 10,000 to 12,000 vibrations per minute through a heavy-duty eccentric vibrator head supported by duplex bearings. Built for easy portability, the Thor ELV-5 weighs 18 15/16 pounds, and the ELV-10 weighs 23 11/16 pounds. The drive of each can be extended to 20 feet with extensions attached by means of a Thor ball-bearing connector.

For further information write to the Thor Power Tool Co., Construction Equipment Division, Dept. C&E, 175 N. State St., Aurora, Ill., or use the card at page 18. Circle No. 85.

New submersible pump eliminates suction hose



The Pacific Pumping Co. has available a new submersible pump said to be always primed and with suction hose eliminated.

Known as Type SA, the pump reportedly operates in muddy water or sludge, under flood or semidry conditions, in hot or freezing climates.

Water discharge passes along the side of the motor, cooling the specially insulated windings. Motor ball bearings are lifetime-lubricated.

For further information write to the Pacific Pumping Co., Dept. C&E, P. O. Box 44, Oakland, Calif., or use the card at page 18. Circle No. 26.

WATCH WATCO FOR NEW APPLICATIONS IN PRESTRESSED CONCRETE

This is a sketch of the new Jacksonville Food Fair Super Market, showing the double tee side wall construction.

Prestressed members produced by CAPITOL PRESTRESS COMPANY, Jacksonville, Florida

WATCO double-tee forms were used to achieve this striking effect which is both economical and efficient.

WRITE FOR OUR LATEST CATALOG

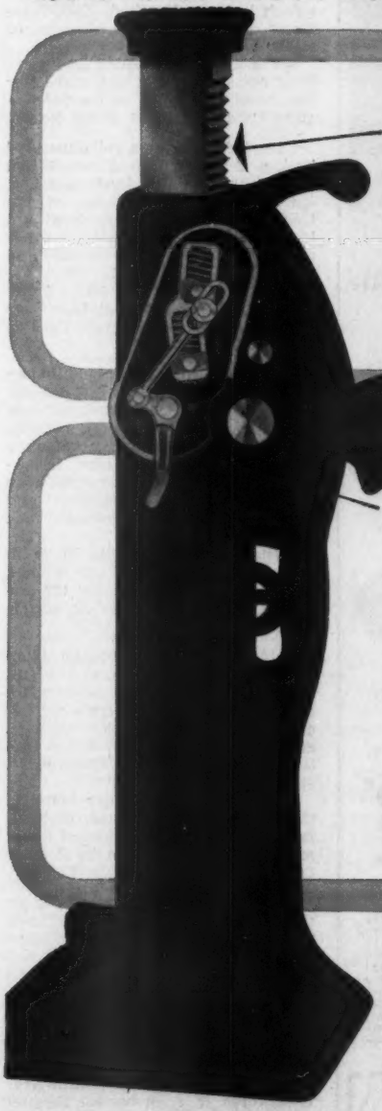
watco STEEL FORMS

DIVISION OF PLANT CITY STEEL CORPORATION

P. O. BOX 1308 • PLANT CITY • FLORIDA

For more facts, use Request Card at page 18 and circle No. 403

DUFF-NORTON Ratchet Jacks are safer...last longer



safer... because the forged steel rack bar on Duff-Norton ratchet jacks is larger and stronger than the rack bar on any other make. Also, these jacks can not trip under load which guards men and equipment.

last longer... because the exclusive spring mechanism makes maintenance easy. It is a patented self-contained, one-piece unit. It can be adjusted, repaired or replaced without taking the jack apart. Tension can be tightened by the turn of a screw. It can be cleaned by removing cover plate and four cotter pins. After years of service a worn mechanism can be quickly replaced.

Years of hard use are built into every one of the nine models—capacities range from 5 to 20 tons. For rugged, dependable, fast lifting power at minimum cost ask your distributor for Duff-Norton Ratchet Jacks.

DUFF-NORTON COMPANY

Four Gateway Center • Pittsburgh 22, Pa.

COFFING HOIST DIVISION • Pittsburgh, Pa.

DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

COFFING HOISTS
Ratchet Lever • Air
Hand Chain • Electric

For more facts, use Request Card at page 18 and circle No. 404

Product LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Centrifuge kerosene equivalent test—a bulletin describing the apparatus and procedures for determining the surface capacities of aggregates used in bituminous mixtures by means of a centrifuge kerosene equivalent (CKE) test. Includes a series of five charts to aid in plotting and comparing test results.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 13.

Make yourself HEARD ! ... without Screaming your lungs out.

Just speak in a *normal* voice . . . and let your compact, lightweight, "one-piece" Audio HAILER *do the work!* New "TP" (transistor-powered) model *projects* your words . . . *like a harpoon*—in a commanding "beam" . . . to anyone within a *half-mile* radius.

Yet Hailer is completely self-contained . . . NO external connections whatever . . . weighs only 5¾ lbs. . . . and runs on low-cost standard flashlight cells. Coupon below brings full details and price list.

AUDIO HAILER
The original power megaphone, and most widely used "one-piece" portable voice system on earth. Weatherproof finish in two-tone green or fire engine red.

AUDIO TP HAILER® transistor-powered
PORTABLE MEGAPHONE

SUPER-HAILER
To penetrate through severe adverse noise levels . . . new SUPER-Hailer concentrates a 16-watt "sound beam" to pierce the surrounding roar. Mile range in quiet conditions.

AUDIO EQUIPMENT CO., INC.
Port Washington 40, N. Y.

☐ Send color brochure and price list, describing "TP" Audio Hailer.
☐ Send details of "TP" Super-Hailer.

Name.....
Company or Dept.....
St. & No.....
City.....Zone No. (if any).....State.....

For more facts, use coupon or circle No. 405

Lifting jacks—an illustrated brochure on the complete Duff-Norton line of lifting jacks. Specifications are included.

Write to the Duff-Norton Co., Dept. C&E, Four Gateway Center, Pittsburgh 22, Pa., or use the Request Card at page 18. Circle No. 52.

Sweeper—data on the M-B sweeper available for Ford tractor Models 8N, NAA, 600, and 800. Designed for a wide variety of uses, the broom is said to be easily and quickly mounted or removed. Also discusses 2-way angling hydraulic sweepers. Specifications.

Write to the M-B Corp., Dept. C&E, 1635 Wisconsin Ave., New Holstein, Wis., or use the Request Card at page 18. Circle No. 123.

Convertible crane—literature on the Manitowoc Model 3400 65-ton crane convertible to dragline, shovel, trench hoe, or clamshell. Text illustrated with photographs; close-ups of major components.

Write to the Manitowoc Engineering Corp., Dept. C&E, 16th and River Sts., Manitowoc, Wis., or use the Request Card at page 18. Circle No. 98.

Crawler tractor—a well illustrated booklet describing the Eimco Model 103 100-hp diesel crawler-tractor line. Includes full specifications on the tractor, bulldozers, and front-end loaders, as well as schematic drawings and coded listing of performance and other features. Bulletin L-1097.

Write to The Eimco Corp., Dept. C&E, P. O. Box 300, Salt Lake City 10, Utah, or use the Request Card at page 18. Circle No. 74.

Concrete forms—a bulletin on Atlas Compo concrete forms. Stresses such features as forged slots for easy insertion of ties, reinforced corners, and box-type stiffeners that increase strength but reduce weight. In addition, states the literature, the forms are simply assembled and quickly stripped. Text illustrated with photos and drawings.

Write to the Irvington Form & Tank Corp., Dept. C&E, 100 William St., New York 38, N. Y., or use the Request Card at page 18. Circle No. 38.

Self-propelled mixer—an illustrated brochure on the Trav-L-Plant, a self-propelled rotary in-place mixer explains how the machine stabilizes and reclaims highway base, subbase, and surface course. Also covers features and specifications. Bulletin No. 200.

Write to the American-Marietta Co., Construction Equipment Division, Dept. C&E, 13050 Blue Mound Road, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 79.

Floodlights—a catalog describing the complete Stonco line of new higher-output mercury vapor weatherproof floodlights. Illustrations and specifications on single units and clusters for pole-top, mid-pole, wall, or surface mounting—with or without integrally mounted transformers. Catalog MV660.

Write to the Stonco Electric Products Co., Dept. C&E, 333 Monroe Ave., Kenilworth, N. J., or use the Request Card at page 18. Circle No. 25.

Automatic welding—a folder illustrating and describing the complete Hobart line of automatic and semiautomatic arc-welding equipment. Applications for different automatic welding processes also illustrated.

Write to the Hobart Bros. Co., Dept. C&E, Box 8129, Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 5.

Cleaning compound—literature describing the benefits of Tar-X, a cleaning compound designed to cut grease, tar, asphalt, oil, or sludge. According to the manufacturer, Tar-X may be sprayed, painted, or mopped onto a surface, and then hosed off with clear water. It is said to be harmless to paint.

Write to Certified Laboratories, Dept. C&E, 2709 Ludelle St., Fort Worth, Texas, or use the Request Card at page 18. Circle No. 104.

Steam cleaners—a catalog describing three types of Malsbary cleaners: fireless steam cleaners, self-contained steam cleaners, and HPC (hydraulic pressure combination) cleaning systems. Tricycle, trailer, or stationary mountings, available for most models, also are shown.

Write to the Malsbary Mfg. Co., Dept. C&E, 845 92nd Ave., Oakland 3, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 55.

ENGINEERED MATERIALS & EQUIPMENT FOR EVERY PRESTRESSED OPERATION

Now you can obtain a full line of engineered materials and equipment for your prestressed operation from a single supplier—Intercontinental Equipment Co.

You'll find we provide fast delivery, competitive prices, and highest quality for the *full range of the materials and equipment listed at the right.*

For a free copy of our products catalogue, or engineering assistance on prestressing material or equipment, just write or phone:

- jacks—pumps
- bearings
- Herculite—nylon curing tarps
- strand anchorages
- post-tensioning components

IEC PRESTRESSED CONCRETE DIVISION
INTERCONTINENTAL EQUIPMENT CO., INC.
Prestressed Concrete Division • 120 Broadway, New York 5, N. Y.

Visit us at Booths 21 & 22—6th Annual P.C.I. Convention, New York City, Sept. 27-30.

For more facts, use Request Card at page 18 and circle No. 406

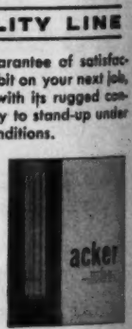
ANNOUNCING
ACKER DIAMOND BITS
AN ALL-NEW QUALITY LINE

Now, a quality line of moderately priced diamond bits takes its place in the distinguished Acker line of drilling equipment.

Acker manufactures and stocks a variety of diamond bits including a complete line of thin-wall diamond bits.

Acker diamond bits will do the most exacting job better and more economically. They're expertly designed and crafted of the finest materials and workmanship in Acker's new, ultra-modern plant. Complete inspection and quality control plus Acker's impeccable reputation for reliability and dependability are your guarantee of satisfaction. Try an Acker bit on your next job, you'll be pleased with its rugged construction and ability to stand-up under the most severe conditions.

FREE
Write today for free 28 page diamond bit and core barrel Bulletin 10 C&E



ACKER DRILL CO., INC.
P. O. Box 830
Scranton 2, Pa.

Manufacturers of a complete line of: Soil Sampling Tools • Rotary Earth Augers • Diamond & Shot Core Drills • Earth Boring Equipment • Diamond Bits • Drilling Accessories & Supplies

For more facts, use Request Card at page 18 and circle No. 407

Aluminum chain—literature describing Bison seamless aluminum chain. Emphasizes noncorrosive, nonmagnetic, nonsparking, and high-strength features. Gives information on link sizes available.

Write to the Bison Aluminum Chain Co., Inc., Dept. C&E, 241 Hertel Ave., Buffalo 7, N. Y., or use the Request Card at page 18. Circle No. 87.

Cut Rod, Wire

FAST • EASY TO USE • PORTABLE

MANCO HYDRAULIC GUILLOTINE

Ideal for use in Pre-Stressed Concrete Work

You can't match a Manco Hydraulic Guillotine for ease and speed of cutting heavy wire and reinforcing rod. From 10 to 65 tons cutting thrust is developed in these relatively portable tools . . . bites right through rod and wire in as little as ¼ second per cut. Three models available with maximum capacities of ½", 1" and 1¼".

A typical Manco Guillotine cutter is illustrated. Complete Manco power operated hydraulic unit includes cutting head, motor, pump and pump reservoir.

AVAILABLE IN A VARIETY OF READILY PORTABLE TOOLS

Model MC-35 with integral hand pump. Manually operated completely portable. 1" capacity.

Lift truck mounted Guillotine Cutter and hydraulic booster pump utilizes truck hydraulic system. Cutter will cut 1" rod in 1 second.

Manco Guillotines can be dolly mounted for portability. Motor can be electric or gasoline. Cutting head is mounted on spring tension balancer.

Write For Catalog . . . Dept. CE-9

MANCO MFG. CO. *Bradley, Illinois*

For more facts, use Request Card at page 18 and circle No. 408

Jay Tamper maintenance: "2 years - $17"

The Roy Klossner Company, San Antonio, Texas, sells Jay Tampers to such blue ribbon contractors as the Bechtel Corporation, which used 7 of them on the Reynolds Aluminum project near Gregory, Texas.

Reports Klossner: "The first 50 Jay Tampers we sold averaged $17 for replacement parts over a 2-year period. Double that to count labor, and maintenance still figures out at less than 4c per hour."

Savings on such jobs as the Port Charlotte Residential Development and the Tidewater Refinery are similar. In one case, compaction cost per cubic yard was cut from $2.68 to 12c.

Even greater savings are now available with Jay's new models, which tamp harder, faster, better on all soils and blacktop. Improvements include stepped-up power, new handles, and a new trailer for easy transport.

See your Jay dealer for a free demonstration, or send for new Catalog J-0. Jay Company, Division of J. Leukart Machine Co., Inc., 2226 South Third Street, Columbus 7, Ohio.

JAY tampers

For more facts, use Request Card at page 18 and circle No. 409

Crane-excavator—a catalog on the Lorain Model 50, a 25-ton, 1-yard-capacity, crawler-mounted shovel-crane. Gives details of construction including "joy-stick" controls, square-tubular-chord boom, and oil-enclosed travel mechanism. Action photographs.

White to The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 92.

Welding equipment—a new edition of Air Reduction's Aircomatic (gas-shielded metal-arc) welding-equipment catalog. Covers the complete line, both manual and automatic. Also gives data on Aircomatic welding wires, shielding gases, and gas delivery systems.

Write to Air Reduction Sales Co., division of Air Reducton Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 117.

Truck, tractor maintenance—a catalog describing in detail a wide variety of special tools and hydraulically operated maintenance equipment used to service trucks, tractors, and other construction equipment. Illustrated with on-the-job photographs. Catalog No. A-9.

Write to the Owatonna Tool Co., Dept. C&E, 381 Cedar St., Owatonna, Minn., or use the Request Card at page 18. Circle No. 56.

Steel joists—a bulletin on Ryerson S and L Series open-web steel joists said to meet Steel Joist Institute specifications. Dimensions and properties given. Technical Bulletin 70-7.

Write to Joseph T. Ryerson & Son, Inc., Dept. C&E, Box 8000-A, Chicago 80, Ill., or use the Request Card at page 18. Circle No. 115.

Core drills—a folder on Felker Core-Lock diamond abrasive core drills for drilling all hard, brittle, nonmetallic materials. Designed to flush the rim as it drills, the Core-Lock unit is said to feature fast cutting, long work life, and easy application. Form CDG-7366.

Write to the Felker Mfg. Co., Dept. C&E, 1125 Border Ave., Torrance, Calif., or use the Request Card at page 18. Circle No. 120.

Forms—literature on the Duraform concrete-forming system. Points out that each Duraform panel is reversible, can be set by one man, has built-in hardware, and has framing and bracing combined in one unit. Text illustrated with photographs.

Write to Duraform, Inc., Dept. C&E, 2903 W. Beltline Highway, Madison 5, Wis., or use the Request Card at page 18. Circle No. 119.

Foundation pile shells—an illustrated folder describing the benefits of Hel-Cor foundation pile shells for buildings and bridges. Discusses steps in mandrel driving and gives how-to-specify information. Form No. PS-7760.

Write to Armco Drainage & Metal Products, Inc., Dept. C&E, 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 100.

Bending machines—a catalog describing the complete Wallace line of rotary benders for the forming of tube, pipe, bars, structural shapes, and channels from steel, stainless steel, copper, brass, aluminum, and other metals. These benders range from hand to fully automatic hydraulic units.

Write to the Wallace Suppliers Mfg. Co., Dept. C&E, 1304 Diversey Pkwy., Chicago 14, Ill., or use the Request Card at page 18. Circle No. 40.

Hydraulic hoists and bodies—a complete catalog covering the Marion line of hydraulic hoists and truck bodies. Well illustrated with photographs and drawings. Brief specifications given for each unit described.

Write to The Marion Metal Products Co., Dept. C&E, Box 406, Marion, Ohio, or use the Request Card at page 18. Circle No. 124.

Concrete-testing equipment—a brochure describing and illustrating a variety of Forney concrete-testing equipment. Includes compression testers, a tensile machine, beam breaker, abrasion machine, and pipe tester.

Write to Forney's, Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 72.

Forms—a bulletin describing Maco-Form, a standard ½-inch×26-inch corrugated sheet, for concrete roof and floor slabs. Contains load tables and installation instructions.

Write to Macomber, Inc., Dept. C&E, Canton 1, Ohio, or use the Request Card at page 18. Circle No. 97.

Power tools—literature including photos and condensed specifications of a wide variety of power tools. Covers saws, drills, routers,

(Continued on next page)

MAKE COLD WEATHER PROFITABLE

Kelley

HOT SHOT SPACE HEATERS

5 MODELS, 75,000 to 450,000 Btu/HR. C. S. A. models, all sizes.

HEAT ON WHEELS

Let 'er blow outside, work goes on inside with portable Kelley Hot Shot Space Heaters. A mere flip of the switch starts warm air flowing instantly. Kelley Hot Shots are clean, safe, quiet, ventless, and odorless . . . completely automatic with thermostatic control and a low-fuel cut-off switch. They cost only a few pennies an hour to operate. And how they can stretch your working season!

★ Heats buildings during construction
★ Dries, warms construction materials
★ Warms workmen and work areas, outdoors or in.

Kelley

MACHINE DIVISION
The Wiesner-Rapp Co., Inc.
285 Chicago St., Buffalo 4, N. Y.

Please send me more information on the Kelley HOT SHOTS.

Name _____

Street _____

City _____ Zone _____ State _____

For more facts, use coupon or circle No. 410

Construction Camera

Compaction around piles sunk to bedrock, 150 to 200 feet below ground level, is being handled by Kelley Power Tampers for the Prudential Center job in Boston. The 31 1/3-acre city development includes 16 buildings, a municipal auditorium, six apartment houses, and other structures.

Excavation for the Niagara Power Project goes deeper; a Bucyrus-Erie with Esco bucket loads an Easton Car trailer that has its floor lined with Jalloy plates to increase resistance to abrasion. Plates are welded to the sides and front of the body and bolted to the subflooring.

Provide Permanent Improvement?

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BRIDGE FLOORING
for bridges, overpasses, backing for piling

Economy and maintenance minded budgets suggest consideration of permanent durability, engineered strength and low cost maintenance free service provided by this proven highway material. Send for free design manual.

Highway Guard Rail
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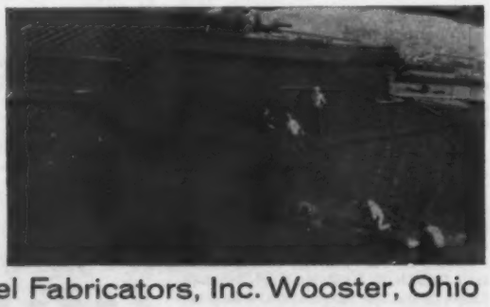
Metal Doors & Frames
Metal Buildings



USF

United Steel Fabricators, Inc. Wooster, Ohio

For more facts, use Request Card at page 18 and circle No. 411

Product Literature

(Continued from preceding page)

planes, belt and disk sanders, shears, drivers, portable and bench grinders, polishers, blowers, pneumatic tools, and abrasive products.

Write to the Skil Corp., Dept. C&E, 5033 Elston Ave., Chicago 30, Ill., or use the Request Card at page 18. Circle No. 14.

Forms—a catalog on Symons Steel-Ply forms, with drawings and on-the-job photos. Covers such items as gang-forming bolts, all-steel pilaster forms, and gives expanded information on the Lo-Wall steel trench form. Data on ties and other accessories.

Write to the Symons Clamp & Mfg. Co., Dept. C, Dept. C&E, 4249 W. Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 60.

Cement-handling system—literature on the Air Conveyor air unloading and conveying system for bulk delivery by truck. Discusses such benefits as direct truck-to-bin delivery, less maintenance due to fewer moving parts, greater capacity with less horsepower.

Write to the Air Conveyor Co., Inc., Dept. C&E, P. O. Box 908, Maxon Road, Schenectady, N. Y., or use the card at page 18. Circle No. 118.

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
PILE TESTING
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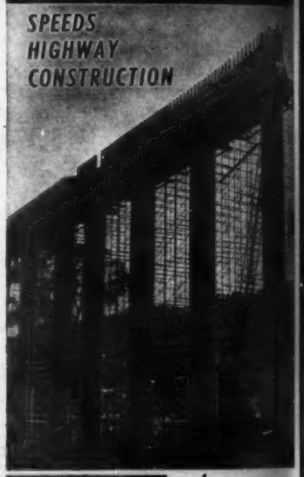
For more facts, circle No. 412

BIL-JAX

BIL-JAX SCAFFOLD SHORING



BUY or RENT

Cross Westchester Freeway right on schedule.....

Building 10 bridges, one viaduct and three culverts, Bil-Jax scaffold-shoring comes in handy and is used on job after job by Mount Vernon Contracting Corporation in keeping "right on schedule" with the last section of the 35 million dollar expressway in Westchester County, N.Y. On the bridge shown here, 1100 feet long, 7 lanes wide, Bil-Jax is used to align each column and support the beams.

Sales and rental outlets throughout U.S. and Canada. Write for catalog.

★Our engineers gladly furnish layouts and estimates for scaffold-shoring jobs... large or small. Ask for free copy of Shoring Manual.

BIL-JAX Archbold, Ohio

For more facts, circle No. 413

Two 130-ton steel girders, 190 feet 10 inches long and 12 feet 8½ inches deep—shipped by rail and car float—arrive at the Throgs Neck Bridge in New York City. Erection of the steel for the superstructure is being handled by Bethlehem Steel Co., Bethlehem, Pa.

Shoulder material is spread at a rate of 300 yards per hour by an Ulrich Model 18 Dozor base spreader that mounts directly on the dozer blade of a Cat. The rig, which spreads in any width from 8 to 18 feet, is putting down material 10 to 15 feet wide and 6 inches deep for 11 miles of road near Clanton, Ala.

MOBILE OFFICE Units are low in cost . . . Built to your specifications . . . There's a unit to fill your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

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SAW BLADE

Fast, Accurate Cutting Through Most of the Hardest Abrasive Materials Known

Saw hardest concrete, sandstone, granite, marble, silica brick, monofrax, zac block and many others. Combine proper power consumption with long life for increased production savings. Available with 14 different cutting edge bonds for top performance in any material.

Write for Illustrated Literature and Prices — **FREE**

HOFFMAN BROS. DRILLING Co.
Box 426 Punxsutawney, Pa.

For more facts, circle No. 415

Product Literature

Sheepsfoot roller—a fact sheet on the American Road Runner Model ADC120, a sheepsfoot roller for use with 4-wheel rubber-tire tractors. Features of the unit include feet that clean and pull easily, and that compact out as well as down.

Write to the American Steel Works, Dept. C&E, 1211 W. 27th St., Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 76.

Crushing—a "Handbook of Crushing," a 40-page booklet discussing mechanical size reduction. Describes various reduction methods—impact, attrition, shear, and pressure—as well as many kinds of crushing equipment. Illustrated with diagrams and charts.

Write to the Bath Iron Works Corp., Pennsylvania Crusher Division, Dept. C&E, 323 S. Matlock St., West Chester, Pa., or use the Request Card at page 18. Circle No. 102.

Versatile curb builder—a folder on the all-electric Iowa Curbmaster designed to handle curb, gutter, and widening operations in a single pass. Describes and illustrates separate heads for a variety of work. Gives general specifications.

Write to the Iowa Construction Equipment Corp., Dept. C&E, Cedar Falls, Iowa, or use the Request Card at page 18. Circle No. 121.

Welding—a data sheet describing the new J. B. Nottingham line of single-operator control units for multi-arc welding systems. Available in six models with ratings from 230 to 400 amp, adjustable in 5 or 10-amp steps, these Weldline units may be connected in parallel for higher welding currents, according to the literature.

Write to J. B. Nottingham & Co., Inc., Dept. C&E, 441 Lexington Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 7.

One-man compactor—a brochure on the Racine Rapak one-man-operated compactor featuring interchangeable shoes for a wide range of jobs. Lightweight and self-contained, the machine insures 95 to 98 per cent Proctor density, states the literature. Photographs.

Write to Racine Hydraulics & Machinery, Inc., Dept. C&E, 2000 Albert St., Racine, Wis., or use the Request Card at page 18. Circle No. 125.

Steel shores—a folder describing Safway steel shores. Stresses that they are one-man handled, have greater loading capacity, are completely self-contained, are adjustable to exact heights, and require less bracing. On-the-job photographs illustrate the many uses to which the shores may be put. A graph shows shore capacities at safe loads. Bulletin S-601.

Write to Safway Steel Products, Inc., Dept. C&E, 6228 W. State St., Milwaukee 13, Wis., or use the Request Card at page 18. Circle No. 84.

Contractors tell us it's sensational! It really proved itself in the field — over 5,000 sold last year. Priced so low you can buy several!

- One simple oil burner pressure adjustment nearly doubles regular output 200,000 BTUs.
- Push button control. Lights instantly —up to 500 degrees in 70 seconds. Thermostat maintains constant temperature ranging from 10 to 90 degrees. Shuts off automatically when temperature is reached.
- Fully automatic oil burner burns No. 1 or No. 2 fuel oils. Runs 8 hours on one filling. Gas engine driven model priced slightly higher.
- 110 volt fan delivers 2,500 cu. ft. of air per minute.
- Lifetime guarantee.

For more facts, use coupon or circle No. 416

BURCH

Force Feed SPREADER

For uniform deposit of material. The nationally known chip and stone spreader with the exclusive Burch dual feed gate for material depth control.

The standard tool for heavy matting and seal coating, forward or backward spreading.

Write today — ask for the complete data.

The BURCH Corp.
CRESTLINE, OHIO, U.S.A.

RETURN THIS COUPON

Please send complete information on the Burch Force Feed Spreader.

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Management

Highways:

Municipal construction contracts

by GEORGE E. DEATHERAGE, P. E.

construction consultant

Another class of documents covering road construction is used more by cities and towns than by state highway departments.

These documents, which deal with the invitation for bids, instructions to bidders, the proposal, and some general conditions in municipal construction contracts, are on forms prepared jointly by the American Public Works Association and the Associated General Contractors of America. They are identified as AGC Standard form-10 and APWA Form-A. Their various requirements differ from the AIA and AGC documents for buildings, as well as those used by the state highway departments.

Inviting bids

On the form for invitation for bids is given the name, location, division or unit, and project number, if any, of the project. It is stated when and where sealed bids will be received and the time and date when they will be opened.

Notices inviting bids should contain (1) information on drawings, specifications, and other contract documents, (2) information on bid bonds, guarantees, and other bid conditions, (3) name and address of the contracting officer.

Any explanation regarding the meaning or interpretation of the contract drawings, specifications, or other documents must be requested in writing by the bidder, allowing sufficient time for a reply to be received before the bid opening. Such explanations are made in the form of addenda to the documents and are furnished to all bidders, who submit all addenda with their bids. Oral explanations made prior to the bid opening are not binding.

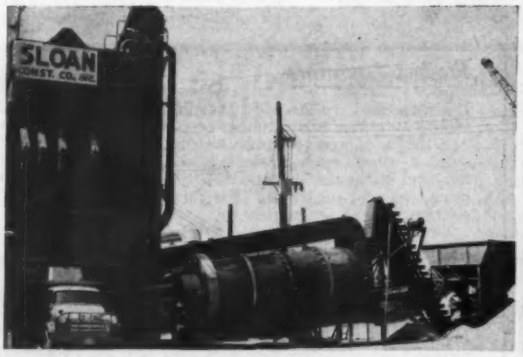
Bidders should visit the work site to inspect pertinent local conditions, such as the character and accessibility of the site, labor conditions, etc. The owner of the site should make available to prospective bidders any information he may have as to subsoil conditions and surface topography. However, he is not responsible for its accuracy.

Security required is submitted with the proposal; failure to do so is cause for rejection. The bidder, at his option, furnishes a bid bond, postal money order, certified check, or cashier's check; or he may deposit, in accordance with Treasury Department regulations, bonds or notes of the United States (at par value) as security in the amount required. Security deposited by unsuccessful bidders is returned as soon as practicable after the opening.

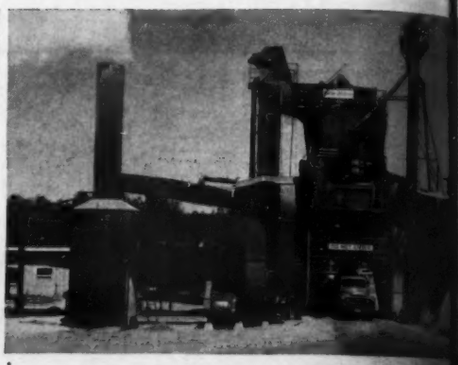
Bids are submitted on the forms, or copies of them, and must be signed by the bidder or his authorized representative. Corrections to entries made on the forms should be initialed by the person signing the bid.

Bidders must quote on all items appearing on the bid forms, unless specific directions in the advertisement, on the bid form, or in the special specifications allow for partial bids. Failure to quote on all items may disqualify the bid. When quotations on all items are not required, bidders may insert the words "no bid" where appropriate.

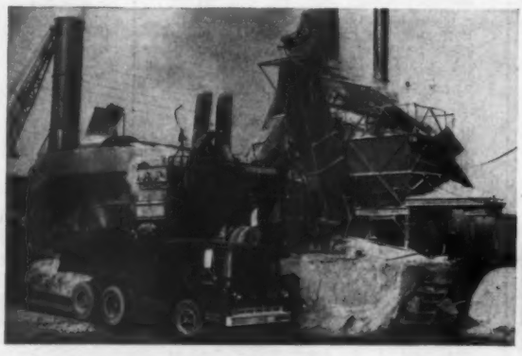
Alternative bids are not considered unless specifically called for. Unless otherwise specified, telegraphic bids are not considered. Modifications of bids already submitted are allowed if they are submitted by telegraph prior to the time fixed in the invitation for bids. Modifications are submitted as such and do not reveal the total



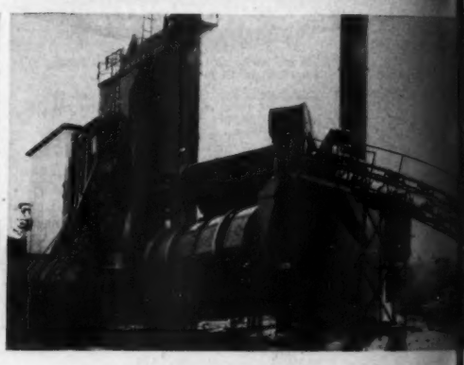
Oldest of the Sloan BatchOmatics is this 894, Liberty, S. C., which runs 100% automatic and has produced 515,000 tons since 1956.



On a permanent location at Lakeside Quarry, Greenville, S. C., this 896 BatchOmatic is nearing the 200,000 ton mark and has run 100% automatic since the fall of 1958.



Here's an 848 plant that has been moved 30 times since 1952 and has produced 1,600,000 tons over that span. Located at Blacksburg, S. C., the plant averages 150 tph with a top of 225 tph.



Third and newest of the Sloan BatchOmatics is this Model 896 shown just starting operations at Pacolet, S. C.

FIVE BARBER-GREENE PLANTS OF LOW-COST MIX FOR

Large asphalt contractor in southeast buys 6th plant to work with nine Barber-Greene finishers on '60 contracts totalling 1,200,000 tons

Sloan Construction Co., Inc., Greenville, South Carolina, large asphalt contractor in the southeast, has produced 5,090,800 tons of low-cost asphalt mix with five Barber-Greene Continuous Mix and BatchOmatic plants.

V. H. Breazeale, vice president and procurement manager, says "We have just added a sixth Barber-Greene—a Model 896 BatchOmatic, to use with our nine Barber-Greene finishers in handling our 1960 contracts which total 1,200,000 tons, including $4,500,000 worth of Interstate jobs.

All Plants Are Barber-Greenes—"We've standardized on Barber-Greene plants," he adds, "because of years of satisfactory service from the equipment and the men who back up what they sell. We buy Continuous Mix plants because we've found they consistently maintain accuracy well within spec tolerances and because of the ease with which they can be transported from job to job and set up in 3-5 days. Because of this good record, we have now decided upon Barber-Greene BatchOmatic plants for our permanent installations. Maintenance on all our plants has been low and our men are so familiar with them that servicing is done in minimum time."

Sloan's present plants, purchase dates and output follow: Model 848 Continuous Mix, 1948, 2,200,000 tons; Model 848 Continuous Mix, 1952, 1,600,000 tons; Model 894 BatchOmatic, 1956, 615,000 tons; Model 896 BatchOmatic, 1958, 175,000 tons; and Model 896 BatchOmatic, 1960, ready to start operations.

Before buying your new asphalt plant, check

This is the fifty-eighth of a series of articles on Construction Management by George E. Deatherage, P. E., The National Schools of Construction, Satsuma, Fla. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by George E. Deatherage & Son, Construction Consultants, Satsuma, Fla.

ment of either the original or revised bids.

Bids must be submitted as directed in the invitation for bids. Those received after the time indicated in the invitation are returned unopened. Bids may be withdrawn at any time before the opening upon the written or telegraphic request of the bidder. Negligence on the part of the bidder in preparing his bid does not constitute a right to withdraw it after the bid opening.

Opening of bids

At the time and place fixed for opening bids, the contents of all bids will be made public for the information of all bidders and other interested parties who may be present in person or by representative.

If more than one bid is offered by one party or his representatives, all such bids will be rejected. A party who has quoted prices to a bidder is not thereby disqualified from quoting prices to other bidders, or from submitting a direct bid on his own behalf.

The contract is awarded to the lowest responsible bidder as soon as practicable after the bid opening. However, the owner has the right to reject any and all bids. In case of error in the extension of prices, the unit bid prices govern. The owner reserves the right to waive any informality in bids at his discretion.

The bidder to whom the award is made enters into a written contract with the owner within time specified in the proposal. Performance and payment bonds are furnished when the formal agreement is signed. The contractor secures and maintains any insurance policies required.

The proposal

At the top of the proposal are repeated the location, name, and division of the project, the nature of the work, the project number, if any, and the date. In the proposal, the contractor agrees to furnish all labor, equipment, and materials and to do the work in accordance with the plans, in consideration of the amount enclosed as a bid guarantee. He also agrees to execute a formal contract with the owner within a stated number of days following acceptance of his bid, to begin the work within a stated number of days after receipt of written notice to proceed, and to complete the work within a stated number of working days thereafter.

(Next month's article will deal with "Highways: Municipal construction contracts—general conditions.")

Two department managers named by Allis-Chalmers

■ The Industrial Equipment Division of Allis-Chalmers Mfg. Co., Milwaukee, Wis., has named G. A. Saar general manager of mechanical departments and W. M. Terry, Jr., general manager of electrical departments.

Saar will have charge of operations of the processing machinery, compressor, and West Allis pump departments. Terry, who had been director of engineering coordination for the A-C Industries Group since 1957, is now responsible for the operations conducted at the Norwood (Ohio) Works, including the electrical and pump departments there, as well as the control and industrial-systems departments, and the rectifier section at the West Allis Works.

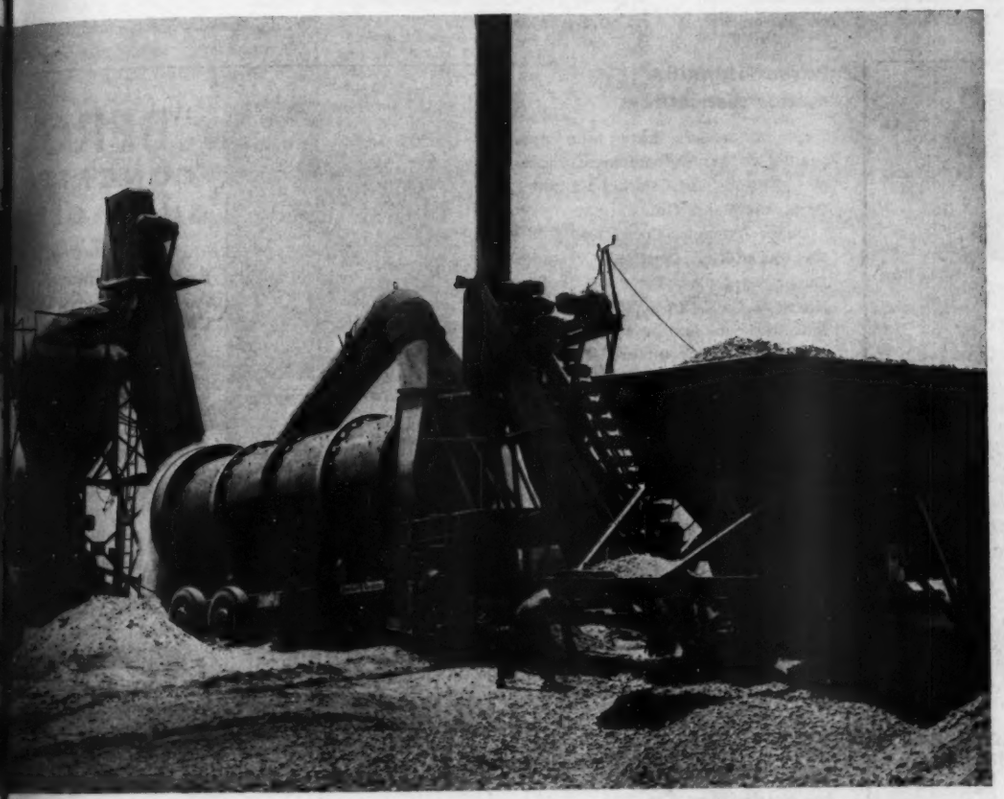
Simplex buys division from Waco-Porter

■ Simplex Forms System, Inc., Rockford, Ill., has purchased the Forms Division of Waco Mfg. Co., a subsidiary of Waco-Porter Corp., Minneapolis, Minn. The acquisition includes inventory and manufacturing equipment for the Waco line of heavy industrial and commercial forms for concrete construction.

The newly acquired line will be marketed as Simplex-Waco Heavy Duty, while the name Simplex will continue to be used on the original line of light commercial forms.

Plan Hold news

■ Plan Hold Corp., maker of vertical and roll filing equipment, has increased its warehouse capacity by doubling space at its South Gate, Calif., plant and adding a new warehouse at Aurora, Ill., with Roy Murray in charge.



ing its 15th year of service is this Model 848 Continuous Mix
, the oldest of the Sloan-owned Barber-Greenes shown at
Forest, S. C. The firm has produced 2,200,000 tons of mix with this durable veteran that shows no signs of approaching retirement age as it heads for the 3,000,000 ton class.

LANT PRODUCE 5,090,800 TONS
K FOR SLOAN CONSTRUCTION CO., INC.

ith your Barber-Greene Distributor and discover
y his plants were again an overwhelming No. 1
ice of contractors in a 1960 poll. He offers you greatest choice of components, greatest values, even complete materials handling systems including conveyors, elevators and feeders.

Only Barber-Greene offers four different finishers plus a new versatile Road Widener—equipment sized for all your needs.

World's No. 1 Manufacturer of Asphalt Paving Equipment

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Distributor Doings

Several new outlets named by Simplex

Simplex Forms System, Inc., Rockford, Ill., has awarded distributorships to two companies and named nine new dealers to handle the company's line of concrete forming equipment.

The distributors are Spanall of the Southeast, Alexandria, Va., and Durham, N. C.; and Holzworth-Werner Co., Buffalo, N. Y., and Fort Lauderdale, Fla.

The dealers are Geo. C. Holcombe Co., Niagara Falls, N. Y.; Coastal Equipment Co., Fort Lauderdale, Fla.; Simplex-Rochester Forms Sales Co., Fairport, N. Y.; Waco Scaffolding of Florida, Inc., Lakeland, Fla.; Waco Scaffolding of Orlando, Orlando, Fla.; Waco Scaffolding of Brevard, Eau Gallie, Fla., Waco Scaffolding of Miami, Miami, Fla.; H & K Sales Co., Mason City, Iowa; and Anderson Distributing Co., Saginaw, Mich.

New dealers for Clark

Two dealers—in Pennsylvania and South Carolina—have been added to the roster of the Construction Machinery Division of Clark Equipment Co. in Benton Harbor, Mich.

Road Machinery, Inc., Devon, Pa., is handling the equipment for eight counties in Pennsylvania and one in Delaware. Carolina Equipment & Parts Co., Columbia, S. C., covers the entire state.

Euclid dealer sponsors maintenance program

Nichols Machinery Co., Longview, Texas, the Euclid dealer in the area, recently sponsored a special service training program for 55 supervisory and maintenance employees of the Lone Star Steel Co., Lone Star, Texas. Two 40-hour sessions were conducted by factory instructors from the Euclid Division of General Motors; classes were devoted to the maintenance of Lone Star's Euclid rear-dumps, scrapers, and crawler tractors.

Marion Power Shovel appoints distributors

New distributors in the United States and Canada have been named by Marion Power Shovel Co., Marion, Ohio, to handle its small-machine line. All have parts, sales, and service facilities for Marion crawler and rubber-mounted machines.

Appointed in this country were H. W. Moore Equipment Co. of Denver, with branches in Grand Junction and Durango, Colo.; Jim Dulaney Machinery Co., Inc., San Antonio, Texas; Porter Supply Co., Huntington, W. Va.; and Bert Smith Road Machinery Co., Inc., Enid, Okla., with branches in Oklahoma City and Tulsa.

In Canada, Marion named Wabe-

ECONMOBILE 620

- 4000 lb. capacity
- Up to 30 ft. 6 in. 33 ft. with Crane Hook
- Reach 19½ ft.
- Clearance just 109"
- 30 MPH top speed
- 73 HP Engine
- Power Steering
- Torque Converter

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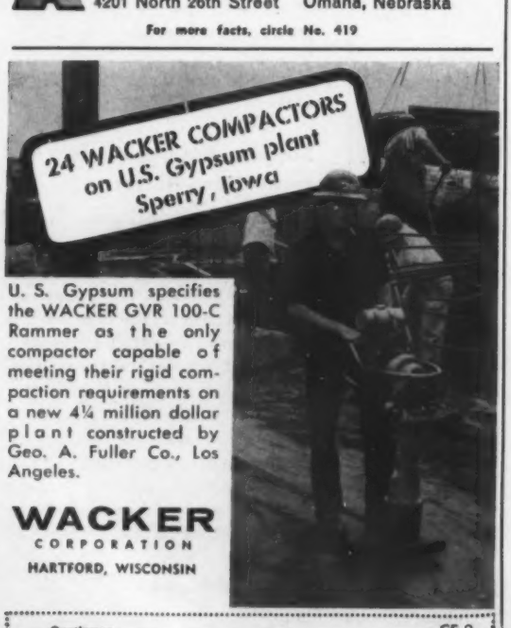

U. S. Gypsum specifies the WACKER GVR 100-C Rammer as the only compactor capable of meeting their rigid compaction requirements on a new 4¼ million dollar plant constructed by Geo. A. Fuller Co., Los Angeles.

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HARTFORD, WISCONSIN

Gentlemen: CE-2
Please send me free descriptive literature and the name of your nearest dealer.
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Address .....
City ..... Zone .... State .....
WACKER

For more facts, use coupon or circle No. 420

Parker-Hannifin names distributors

Several dealers have been appointed to handle equipment made by divisions of Parker-Hannifin Corp., Cleveland, Ohio.

Dupar Dynamics Corp., 1960 S. E. Hawthorne Blvd., Portland, Ore., and Dupar Dynamics, Inc., 695 B St., Hayward, Calif., are handling Parker industrial tube and hose fittings, accumulators, check and relief valves, Crown air-system regulator-filter-lubricators, and other equipment made by Parker Fittings & Hose Division, Parker Hydraulics Division, and the Hannifin Co. Division.

Tube and hose fittings, power cylinders, and air-control valves are being distrbuted in the Kansas City, Mo., area by Ellis Akin Engineering Co., Inc., 2934 Cherry St., of that city.

Crown air-system units are being handled by Livingston & Haven, Inc., 2115 Meeting Street Road, Charleston, S. C., in its area. The firm has a branch at Charlotte, N. C.

Two dealers added by Kwik-Mix Co.

Waco Scaffold & Equipment Co., 3111 S. E. 13th at Powell, Portland, Ore., is a new dealer for bituminous mixers, plaster and mortar mixers, Moto-Bug material handlers, and Hi-Lifter fork trucks made by Kwik-Mix Co., Port Washington, Wis. The dealer will cover the state of Oregon and five counties in southwestern Washington.

Reiley Equipment Corp., Woodside, Long Island, N. Y., for several years a nonexclusive dealer for the Ka-Mo line of boring and drilling equipment, is now an exclusive dealer for the Kwik-Mix line. The company is located at 7200 51st Ave., Woodside.

Dealer adds division to handle Yale trucks

A new industrial truck division has been formed by Reid-Holcomb Co., Inc., 1815 Kentucky Ave., Indianapolis, to handle the line of industrial lift trucks made by the Yale Materials Handling Division of The Yale & Towne Mfg. Co., Philadelphia. The new addition will be headed by William W. Turner.

MODEL H10 (ABOVE)

Gasoline-powered unit especially designed for surfacing concrete highways, runways, streets, floors. Includes exclusive power takeoff for attaching "BERG" flexible shaft surfacing equipment.

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For Surfacing:
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...on Equipment, Ltd., Edmonton, Alta., with branches in Calgary, Lethbridge, and Grande Prairie; and Truck & Tractor Equipment Ltd., Dixie, Ont.

...d distributor news

Two new distributors have been appointed to handle equipment made by Bucyrus-Erie Co., South Milwaukee, Wis.

Albert & Harlow, Inc., Tulsa and Ada, Okla., has the line of convertible crane-excavators, dragline buckets, and transit machines. From offices at 6801 E. Admiral Place, Tulsa, and 2110 N. Broadway, Ada, it covers the east portion of the state.

Contractors' Equipment & Supply Co., Albuquerque, handles the same equipment, plus the Hydrocrane and attachments, in all but seven counties in New Mexico. Its main office is at 707 Broadway N.E.

Mott-Manbeck Machinery Co., Inc., Latham, N. Y., now offers commercial cranes and excavators in addition to the Hydrocrane equipment it handles. The dealer serves fourteen counties in east-central New York.

Unit Crane & Shovel adds new outlets

Two new dealers have been appointed by Unit Crane & Shovel Corp., Milwaukee, Wis. In Louisiana, White Oil & Equipment Co., Inc., Box 5304, Bossier City, is covering parishes in the northern portion of the state. Unit equipment is being handled in twelve counties in the south and east parts of Ohio by Riebel Equipment Co., 5580 W. Broad St., Columbus.

Eimco dealerships

Industrial and Contractors Equipment Division of T. & H. Paolini Co., Inc., Lackawanna, N. Y., is a new area dealer for the tractor-loader division of The Eimco Corp., Salt Lake City, Utah.

The dealer will handle sales and service on the Eimco line of tractors, front-end loaders, and tractor excavators in the Buffalo-Niagara area. Herbert Paolini is president of the division, and Eugene Braunbach is sales supervisor for the account.

H. C. Ormes Construction Co., Minneapolis, Minn., is the new dealer for Eimco crawler tractors in the southern portion of the state. H. C. Ormes is president of the firm, which is located at 5600 Wayzata Blvd.

Minneapolis-Moline names dealer in Utah

Construction and industrial equipment made by Minneapolis-Moline Co., Hopkins, Minn., is being distributed in the state of Utah by Bonneville Equipment, Inc., Salt Lake City. The firm has new headquarters at 3977 S. Second St. West.

The firm handles Willard transit mixers, Hancock elevating scrapers, and Tanco bituminous pavers, in addition to Moline tractors, backhoes, loaders, mowers, dozers, and allied equipment.

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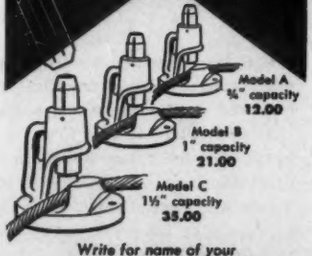

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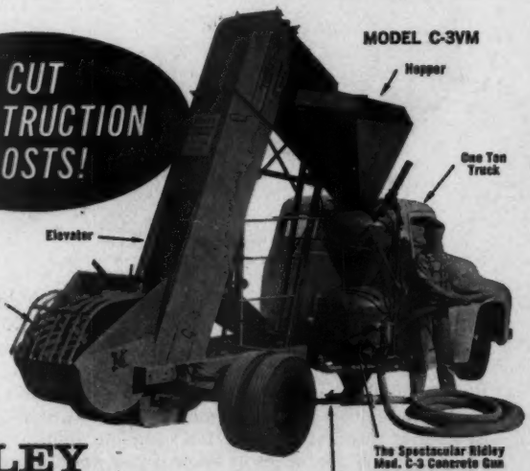
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Manufacturer Memos

A new alignment of top management personnel has been made by **Black & Decker Mfg. Co.**, Towson, Md.

Robert D. Black will be the chief executive officer of the firm; he continues as chairman of the board and of the executive committee, and as a director. **Alonzo G. Decker, Jr.**, executive vice president, succeeds Black as president of the company and will continue as a director. Decker is succeeded as executive vice president by **W. Griffin Morrel**, a B&D director since 1957.

There are now 14 member firms in B&D's international organization.

Appointed vice president of sales for **Clark Equipment International, C. A.**, was **Charles W. Massie, Jr.** He will handle the sale of Clark products in all parts of the free world except the United States and Canada. Clark International, a subsidiary of Clark Equipment Co., Buchanan, Mich., has its chief office in Brussels, Belgium.

The **Charles Bruning Co., Inc.**, Mount Prospect, Ill., has named **James L. Guthrie** its Washington, D. C., representative. Until now, he was assistant representative in that city for the company, manufacturer of copying equipment.

Nello J. Vanelli has been made assistant to the vice president of export, **Electric Steel Foundry Co.**, Portland, Ore., and will continue in his post of assistant to the executive vice president. He is responsible for sales in Latin America, the Pacific, Australia, and the Far East and will supervise technical liaison with overseas licensees.

The San Francisco office of **ESCO International** is being moved to Portland to reduce communication time with the manufacturing divisions. **Halle P. Robb**, formerly ESCO international supervisor in San Francisco, will remain there as district manager of sales for ESCO products.

The Noble Co., Oakland, Calif., has named **Robert C. Clark** vice president and general sales manager. He opened the firm's Northwest sales office in Seattle in 1953 and the Eastern sales division at Cleveland in 1955. Since 1957, Clark has served in the home office as sales promotion manager for the maker of concrete batching plants.

Blaine G. Harrington has been named manager of the Kansas City district of **Air Reduction Sales Co.**, New York, N. Y. Formerly assistant manager of sales in that city, he succeeds J. O. McElligatt, who has retired.

Harrington will handle the sale and distribution of all Airco products marketed through the district facilities in Kansas City, Mo. Air Reduction Sales Co., a division of Air Reduction Co., Inc., manufactures and distributes industrial gases and welding and cutting products.

Jack H. Cox, manager of the Calco Division of **Armco Drainage & Metal Products, Inc.**, Middletown, Ohio, has been elected a vice president of the company.

Cox has been with Armco since 1935. After a variety of assignments in production departments, he became a correspondent in the pipe and formed-products sales department in 1941. In 1950, he was named special assistant in the sales coordination department, and in 1953, manager of drainage and allied products. Last year he moved up to the post of manager of the Calco Division.

The Worthington Corp., Harrison, N. J., has appointed **Forrest L. Jerome** as national supervisor of contractor sales. He was formerly president of Columbia Equipment Co., Portland, Ore.

T. F. Olson has been elected to the newly created post of financial vice president of **The Eimco Corp.**, Salt Lake City, Utah. He was formerly a comptroller for Crane Co., Chicago. From Eimco's head office, Olson will handle all financial matters, as well as accounting functions, for the construction-equipment firm.

Also elected vice presidents were **Wayne L. Dowdey**, general sales manager, and **Dr. Don Dahlstrom**, director of Eimco's Research and Development Center at Palatine, Ill.

Lloyd J. Ely, previously director of manufacturing for domestic operations at **Caterpillar Tractor Co.**, Peoria, Ill., has been appointed a vice president of the company's Product Trade Group. Named to succeed him in his former post is **Gordon Swanski**, assistant manager of the plant.

Stephen Laskevich, Jr., has been assigned by **Joy Mfg. Co.**, Pittsburgh, Pa., to take over the Knoxville, Tenn., district sales office. He will handle sales and service for Joy's rock-drilling and related pneumatic equipment for the construction industry in the area that includes Kentucky, Tennessee, Virginia, North Carolina, South Carolina, Georgia, Mississippi and Florida.

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we don't know how many uses it has!

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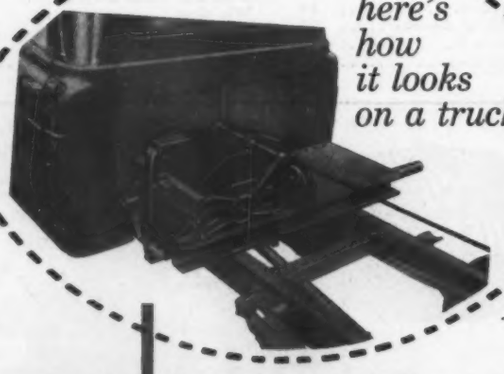

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